Form No. 3461-902 Rev A

TORO®

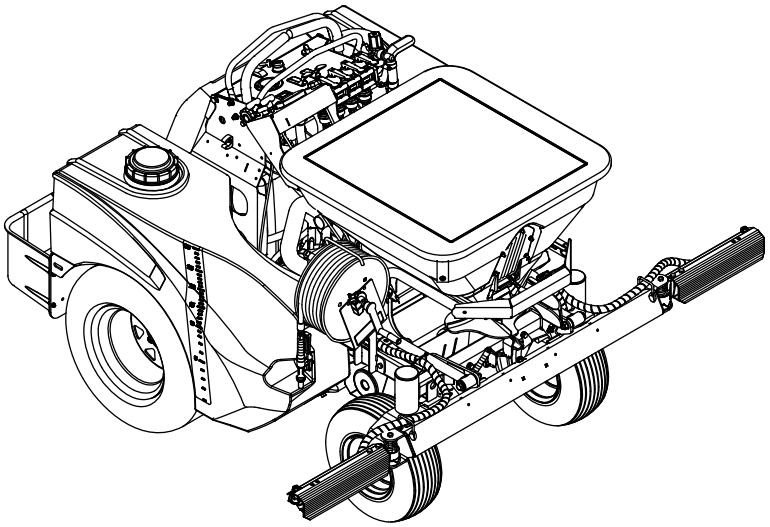
Count on it.

Operator's Manual

52in Sprayer

SprayMaster Max

Model No. 34240—Serial No. 400000000 and Up
Model No. 34242—Serial No. 400000000 and Up



Register at www.Toro.com.
Original Instructions (EN)

3461-902

It is a violation of California Public Resource Code Section 4442 or 4443 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land unless the engine is equipped with a spark arrester, as defined in Section 4442, maintained in effective working order or the engine is constructed, equipped, and maintained for the prevention of fire.

The enclosed engine owner's manual is supplied for information regarding the US Environmental Protection Agency (EPA) and the California Emission Control Regulation of emission systems, maintenance, and warranty. Replacements may be ordered through the engine manufacturer.

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

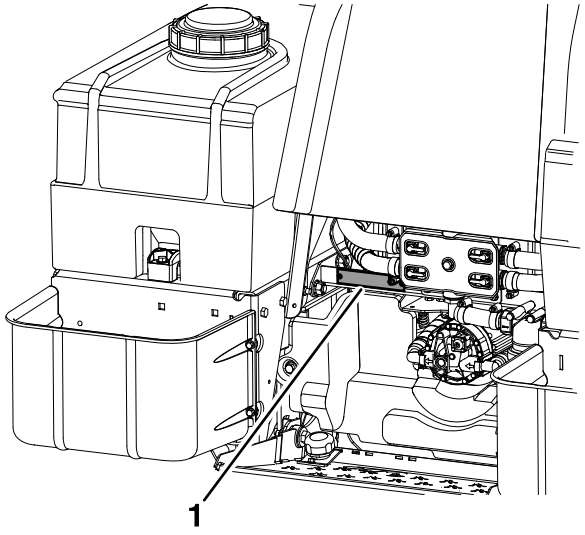
The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

Use of this product may cause exposure to chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. Figure 1 identifies the location of the model and serial numbers on the product. Write the numbers in the space provided.

Important: **With your mobile device, you can scan the QR code (if equipped) on the serial number plate to access warranty, parts, and other product information.**



g386899

Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

Introduction

This stand-on spreader sprayer is intended for use by trained operators in residential and commercial applications. The machine is primarily designed for chemical distribution used for turf care or snow/ice removal at residential grounds, parks, sports fields, and on commercial grounds. Using this product for purposes other than its intended use could prove dangerous to you and bystanders.

Read this information carefully to learn how to operate and maintain your product properly and to avoid injury and product damage. You are responsible for operating the product properly and safely.

Visit www.Toro.com for product safety and operation training materials, accessory information, help finding a dealer, or to register your product.

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Bloomington, MN 55420

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Contents

Safety 4
Safety-Alert Symbol 4
General Safety 4
Safety and Instructional Decals 5
Product Overview 11
Controls 11
Specifications 17
Before Operation 18
Before Operation Safety 18
Fuel Specification 20
During Operation 20
During Operation Safety 20
Operating the Machine 23
Operating the Spreader 25
Operating the Sprayer 35
After Operation 41
After Operation Safety 41
Transporting the Machine 41
Maintenance 43
Maintenance Safety 43
Recommended Maintenance Schedule(s) 44
Notation for Areas of Concern 45
Lubrication 46
Lubricate Grease Fittings 46
Engine Maintenance 46
Service Air Cleaner 46
Check Engine Oil Level 46
Change Engine Oil 46
Fuel System Maintenance 47
Check Fuel Filter and Tank 47
Electrical System Maintenance 48
Check Battery Charge 48
Recommended Jump Starting Procedure 48
Drive System Maintenance 50
Check Tire Pressures 50
Wheel Mount Screw Torque Specification 50
Belt Maintenance 50
Check Condition of Belt 50
Controls System Maintenance 51
Adjusting the Parking Brake 51
Motion Control Linkage Adjustment 51
Motion Control Tracking Adjustment 52
Hydraulic System Maintenance 53
Check Hydraulic Oil and Tank Level 53
Change Hydraulic System Filter and Fluid 53
Hydraulic System Air Purge 53
Maintaining the Chassis 54
Check for Loose Hardware 54
Maintaining the Sprayer and Spreader Systems 55
Check Spreader System 55
Check Sprayer System 55
Check In-line Filter 55
Cleaning 55
Cleaning and Storing Safety 55
Clean Engine and Exhaust System Area 55
Remove Engine Shrouds and Clean Cooling Fins 55
Clean Debris From Machine 56
Waste Disposal 56
Storage 57
Extended or Winter Storage 57
Troubleshooting 58
Schematics 61

Safety

The following instructions are from ANSI standard B71.4-2017.

Safety-Alert Symbol

The safety-alert symbol (Figure 2) is used both in this manual and on the machine to identify important safety messages that you must follow to avoid an accident.

This symbol means **Attention! Become Alert! Your Safety Is Involved!**



g000502

Figure 2

Safety-alert symbol

The safety-alert symbol appears above information which alerts you to unsafe actions or situations and is followed by the word **Danger**, **Warning**, or **Caution**.

Danger indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury.

Warning indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.

Caution indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury.

This manual uses 2 other words to highlight information. **Important** calls attention to special mechanical information and **Note** emphasizes general information worthy of special attention.

General Safety

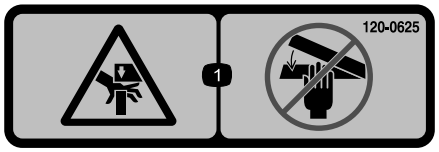
This machine is capable of amputating hands and feet and of throwing objects. Always follow all safety instructions to avoid serious personal injury or death.

- Read, understand, and follow all instructions and warnings in the Operator's Manual and on the machine, engine, and attachments. All operators and mechanics should be trained. If the operator(s) or mechanic(s) can not read this manual, it is the owner's responsibility to explain this material to them; other languages may be available on our website.
- Only allow trained, responsible, and physically capable operators that are familiar with the safe operation, operator controls, and safety signs and instructions to operate the machine. Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- Always use appropriate Personal Protective Equipment (PPE) to guard against contact with chemicals.
- Do not operate the machine near drop-offs, ditches, embankments, water, or other hazards.
- Keep bystanders and children out of the operating area.
- Do not put your hands or feet near moving parts.
- Do not operate the machine without all safety shields, guards, switches, and other devices in place and in proper working condition.
- Park the machine on level ground, disengage drives, set parking brake, stop engine, remove key, or disconnect spark plug wire. Wait for all moving parts to stop before leaving the operator's position. Allow the machine to cool before servicing, adjusting, fueling, unclogging, cleaning, or storing.

Safety and Instructional Decals

- Keep all safety signs legible. Remove all grease, dirt and debris from safety signs and instructional labels.
- Replace all worn, damaged, or missing safety signs.
- When replacement components are installed, be sure that current safety signs are affixed to the replaced components.
- If an attachment or accessory has been installed, make sure current safety signs are visible.
- New safety signs may be obtained from your authorized Toro dealer or distributor.
- Safety signs may be affixed by peeling off the backing to expose the adhesive surface. Apply only to a clean, dry surface. Smooth to remove any air bubbles.
- Familiarize yourself with the following safety signs and instruction labels. They are critical to the safe operation of your Toro commercial spreader-sprayer.

Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or missing.



decal120-0625

120-0625

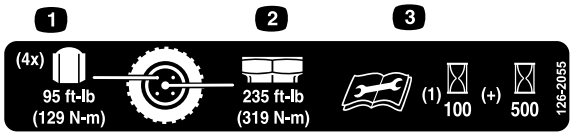
1. Pinch point, hand—keep hands away.



decal120-9570

120-9570

1. Warning—stay away from moving parts, keep all guards and shields in place.



decal126-2055

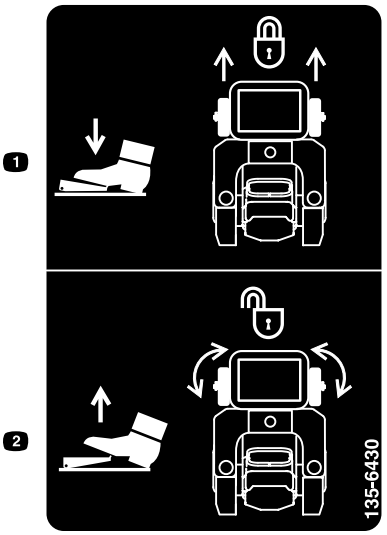
126-2055

1. Wheel lug nut torque 95 ft-lb (129 N-m) (4x)
2. Wheel hub nut torque 235 ft-lb (319 N-m)
3. Read and understand the Operator's manual before performing any maintenance, check torque after first 100 hours then every 500 hours thereafter.



decal133-8062

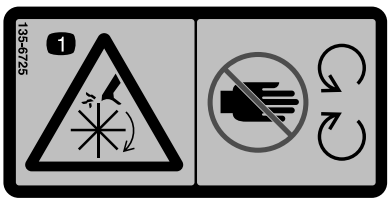
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decal135-6430

135-6430

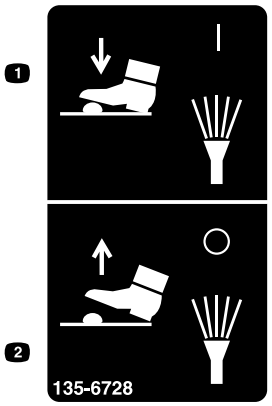
1. Press and hold the foot pedal to lock the caster wheels in the straight position.
2. Release the foot pedal to unlock the caster wheels to allow turning.



decal135-6725

135-6725

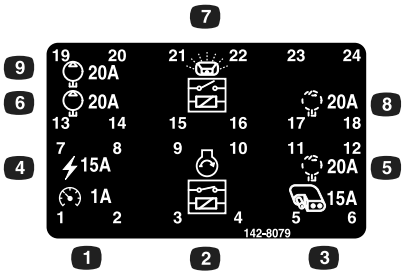
1. Cutting/dismemberment hazard—stay away from moving parts.



decal135-6728

135-6728

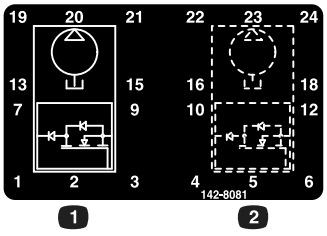
1. Press and hold foot button to turn on spray.
2. Release foot button to shut off spray.



decal142-8079

142-8079

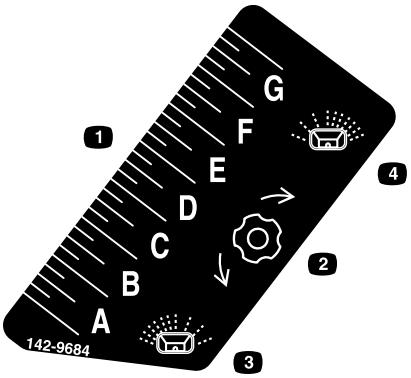
1. Pins 1-2: Speedometer, 1A
2. Pins 3,4,9,10: Ground S/D
3. Pins 5-6: Accessory port
4. Pins 7-8: Main fuse, 15A
5. Pins 11-12: Accessory pump, 20A
6. Pins 13-14: Pump, 20A
7. Pins 15,16,21,22: Spreader relay
8. Pins 17-18: Accessory pump, 20A
9. Pins 19-20: Pump, 20A



decal142-8081

142-8081

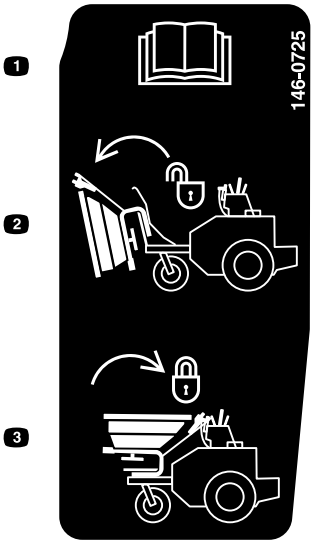
1. Pins 1,2,3,7,19,20,21: Pump solid state relay
2. Pins 4,5,6,10,22,23,24: Accessory pump solid state relay



decal142-9684

142-9684

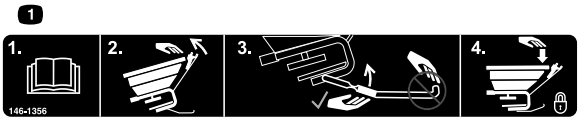
1. Indicator settings
2. Spread pattern control knob
3. Heavy on right side
4. Heavy on left side



decal146-0725

146-0725

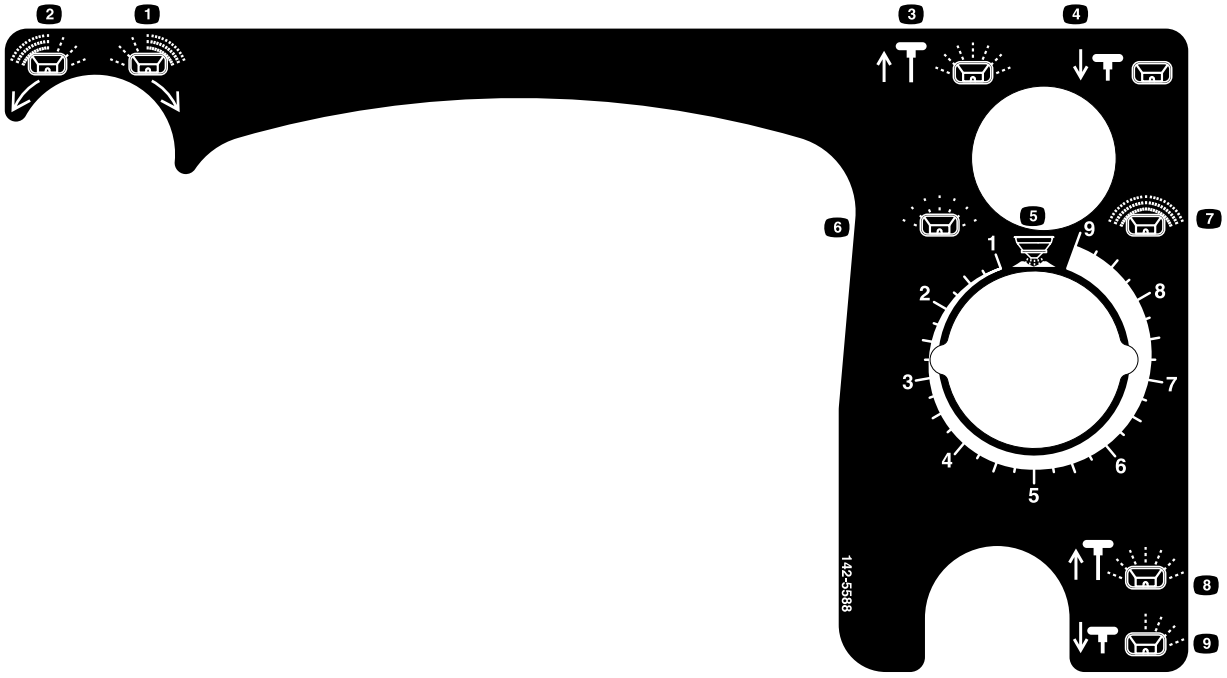
1. Read the Operator's manual
2. Unlock and rotate the hopper forward.
3. Push the hopper rearward and down to lock into place.



decal146-1356

146-1356

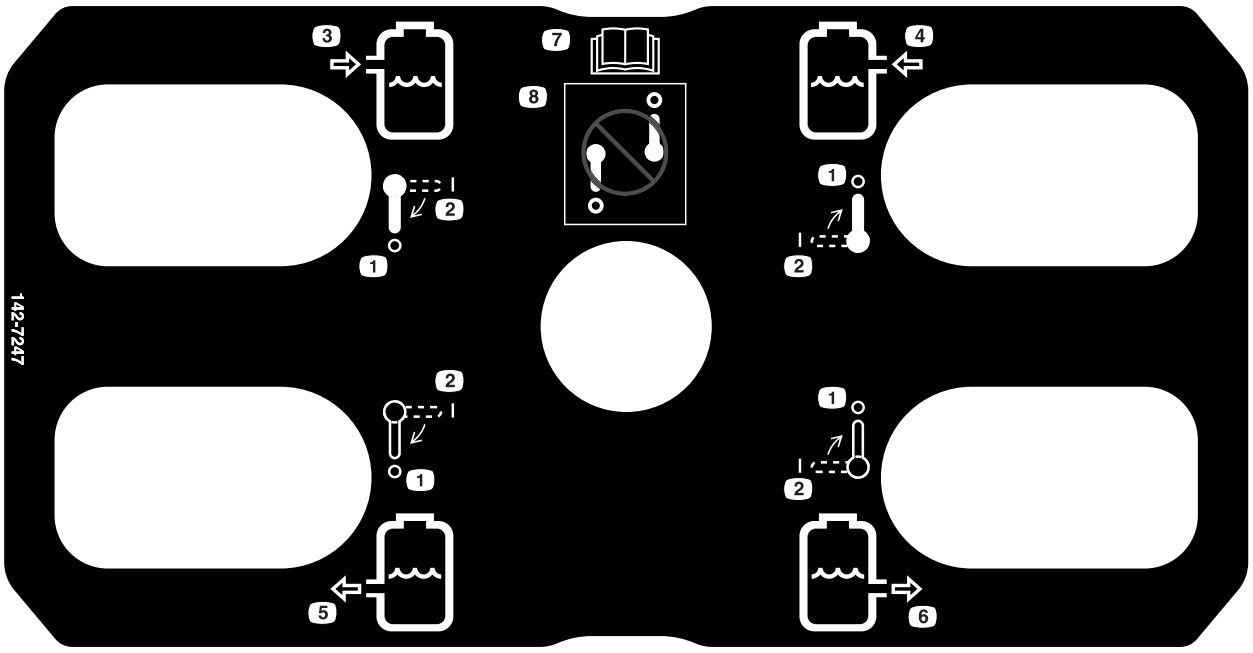
1. Read the Operator's manual; pull the hopper slightly forward; lift prop rod upward by the detent, Do Not grab the rod end; push the back of the hopper downward to lock into place.



decal142-5588

142-5588

1. Spread pattern control–Rotate clockwise if heavy on left side
2. Spread pattern control–Rotate counterclockwise if heavy on right side
3. Spread On–Pull handle up
4. Spread Off–Push handle down
5. Maximum open position (clean out)
6. Rate dial–least material distributed
7. Rate dial–maximum material distributed
8. Deflector–Pull knob up to open
9. Deflector-Push knob down to close



decal142-7247

142-7247

1. Off
2. On
3. Left return
4. Right return
5. Left suction
6. Right suction
7. Read the Operator's manual
8. Do Not have both return valves in the Off position

	PSI	Drop Size	CAPACITY ONE NOZZLE IN GPM	CAPACITY ONE NOZZLE IN OZ./MIN.	SPACING 20 IN — GALLONS PER ACRE MPH 5	GALLONS PER ACRE MPH 6	GALLONS PER 1,000 SQ. FT. MPH 4	GALLONS PER 1,000 SQ. FT. MPH 5	GALLONS PER 1,000 SQ. FT. MPH 6
142-3306	30	VC	0.13	17	7.7	6.4	0.22	0.18	0.15
	40	VC	0.15	19	8.9	7.4	0.26	0.20	0.17
	50	VC	0.17	22	10.1	8.4	0.29	0.23	0.19
	60	C	0.18	23	10.7	8.9	0.31	0.24	0.20
142-3307	30	VC	0.17	22	10.1	8.4	0.29	0.23	0.19
	40	VC	0.20	26	11.9	9.9	0.34	0.27	0.23
	50	VC	0.22	28	13.1	10.9	0.37	0.30	0.25
	60	VC	0.24	31	14.3	11.9	0.41	0.33	0.27
142-3308	30	VC	0.22	28	13.1	10.9	0.37	0.30	0.25
	40	VC	0.25	32	***14.9***	12.4	0.43	***0.34***	0.28
	50	VC	0.28	36	16.6	13.9	0.48	0.38	0.32
	60	VC	0.31	40	18.4	15.3	0.53	0.42	0.35
142-3309	30	XC	0.26	33	15.4	12.9	0.44	0.35	0.29
	40	VC	0.30	38	17.8	14.9	0.51	0.41	0.34
	50	VC	0.34	44	20	17	0.58	0.46	0.39
142-3310	30	XC	0.35	45	21	17	0.60	0.48	0.40
	40	XC	0.40	51	24	20	0.68	0.54	0.45
	50	VC	0.45	58	27	22	0.77	0.61	0.51
142-3311	30	XC	0.43	55	26	21	0.73	0.58	0.49
	40	XC	0.50	64	30	25	0.85	0.68	0.57
	50	VC	0.56	72	33	28	0.95	0.76	0.63
142-3312*	30	XC	0.52	67	31	26	0.88	0.71	0.59
	40	XC	0.60	77	36	30	1.02	0.82	0.68
	50	VC	0.67	86	40	33	1.14	0.91	0.76

HIGH VOLUME SPRAY CHART (XRC TIPS)

At 15 PSI (1 bar) Pressure	At 60 PSI (4 bar) Pressure	PSI	Drop Size	CAPACITY ONE NOZZLE IN GPM	CAPACITY ONE NOZZLE IN OZ./MIN.	HIGH VOLUME SPRAYING (SPACING) 20 IN — GALLONS PER ACRE MPH 5	GALLONS PER ACRE MPH 6	GALLONS PER 1,000 SQ. FT. MPH 4	GALLONS PER 1,000 SQ. FT. MPH 5	GALLONS PER 1,000 SQ. FT. MPH 6
135-8413*		15	VC	0.61	78	36	30	1.00	0.83	0.69
		20	C	0.71	91	42	35	1.20	0.97	0.80
		30	C	0.87	111	52	43	***1.50***	1.20	1.00
		40	C	1.00	128	59	50	1.70	1.40	1.10
117-5839*		15	VC	0.92	118	55	46	1.60	1.30	1.00
		20	VC	1.06	136	63	53	1.80	1.40	1.20
		30	VC	1.30	166	77	64	2.20	1.80	1.50
		40	C	1.50	192	89	74	2.60	2.00	1.70
146-0633**		15	XC	1.22	156	72	60	2.00	1.70	1.40
		20	XC	1.41	180	84	70	2.40	1.90	1.60
		30	VC	1.73	221	103	86	2.90	2.40	2.00
		40	VC	2.00	256	119	99	3.40	2.70	2.30

*Only recommended for use with 4 tip booms or with high volume accessory.
**Only recommended with high volume accessory.
See Parts Catalog for XRC Tip options.

Coarse
Very Coarse
Extremely Coarse

NOTES:
- Always double check your application rates.
- Tabulations are based on spraying water at 70°F (21°C).

146-0776

Spreader / Sprayer Calibration:

Mixing of liquid or dry product should be in accordance to manufacturers labels. Remember this is designed for low volume spraying so the mix will be more concentrated.

Remember that your machine is factory set to put down 1/3 gallon of liquid per 1,000 sq. ft (at 5MPH and 40PSI).

For instance, some products call for 1.1 to 1.5 oz per 1,000 sq. ft. We would recommend using 1.3 (median value of 1.1 to 1.5). Since you are using a 1/3 gallon tip, you need to multiply by 3, then multiply that amount by the number of gallons put in the tank.

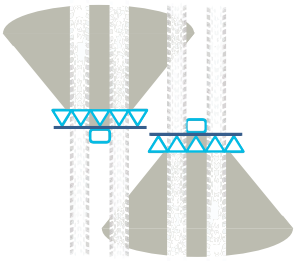
1.3 (median value of 1.1 to 1.5) X 3 (1/3 gallon tip) X gallons of water needed. If filling a 30 gallon tank the equation would look like this: ***1.3 X 3 X 30 = 117 ounces in 30 gallons of water.***

Approximate Granular Calibration

Product	Lbs. per 1,000 sq ft	Full Rate
Fine Pellets	1	4.75
	2	5.25
	3	5.5
Mixed Fine Pellets	2	5.0
	4	6.0
	6	6.5
Small Pellets	2	4.25
	4	5.5
	6	5.75
Nitrogen Pellets Medium	1	4.75
	2	5.5
	3	6.0
Medium Pellets and Granules	2	4.75
	4	5.5
	6	6.5
Large Heavy Pellets	2	5
	4	6.25
	6	7.25

(Calibrated at 5 MPH)

Throw fertilizer back to the center of tire tracks.

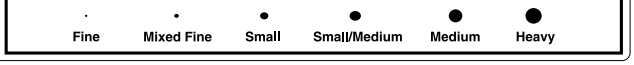


The diffuser balances the spread pattern, by shifting the product placement on the spinner. Placing the product on the impeller close to the shaft or the center will cause the spread pattern to be heavier to the right as it rides the impeller for a longer period. If the product is placed on the outer edge of the impeller, the spread pattern will be heavier to the left (because the spinner is turning clockwise).

1) Start with the spreader pattern control handle all the way forward or in (this is home base).

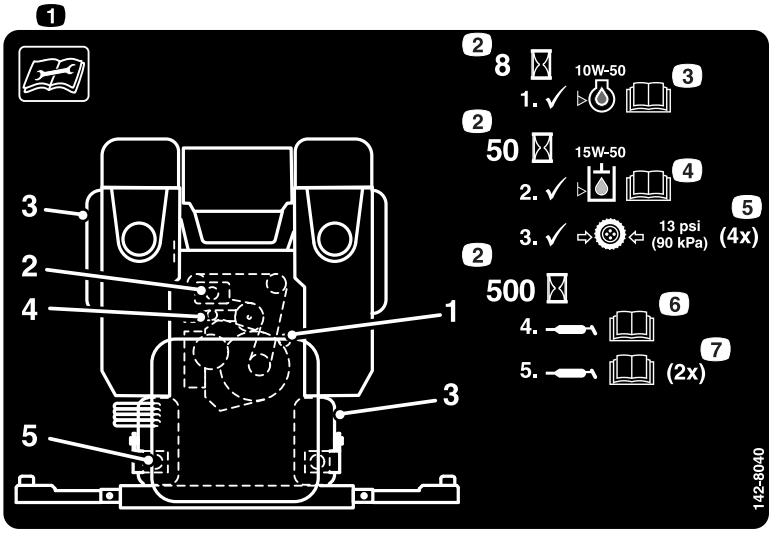
2) Begin to spread the product. As you are spreading you should be able to see the spread pattern in front of you.
Generally, all spreaders will tend to throw fertilizer heavy to the right. As you continue to spread, pull the control handle towards you very slowly (small increments) until you begin to bring the spread pattern directly centered in front of you.

3) Once you have the spread pattern centered, lock the control handle in place. There should be no reason to reset the diffuser for that product unless you see that the spread pattern has changed due to bumping the handle. If it has changed slightly, simply re-adjust the pattern while you're spreading.



decal146-0776

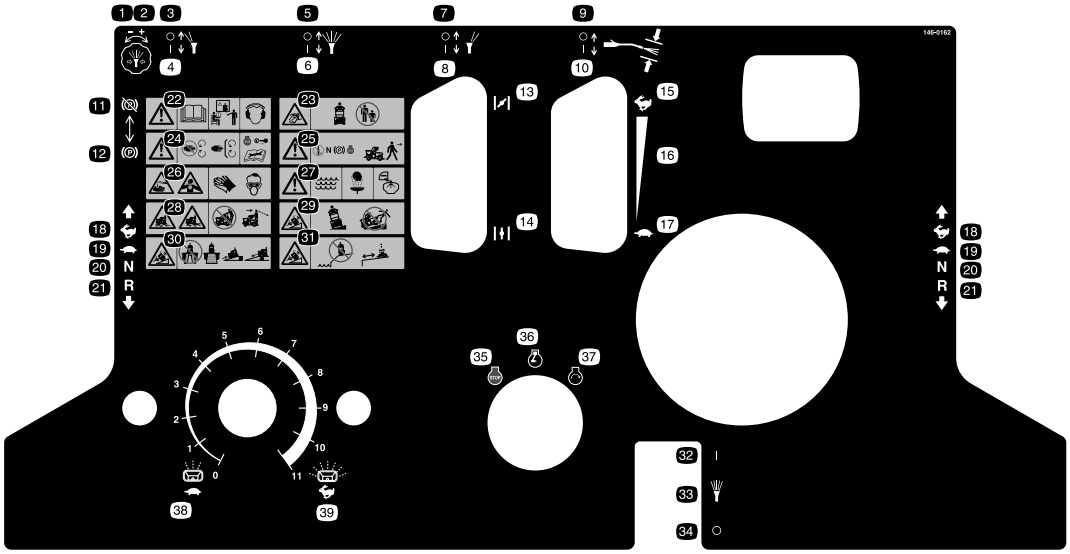
146-0776



decal142-8040

142-8040

1. Read the instructions before servicing or performing maintenance.
2. Time interval.
3. Check engine oil level.
4. Check hydraulic oil level; refer to the *Operator's Manual* for further instructions.
5. Check tire and caster wheel pressure (4 locations).
6. Grease idler pivot; refer to the *Operator's Manual* for further instructions.
7. Grease caster pivots; refer to the *Operator's Manual* for further instructions (2 locations).

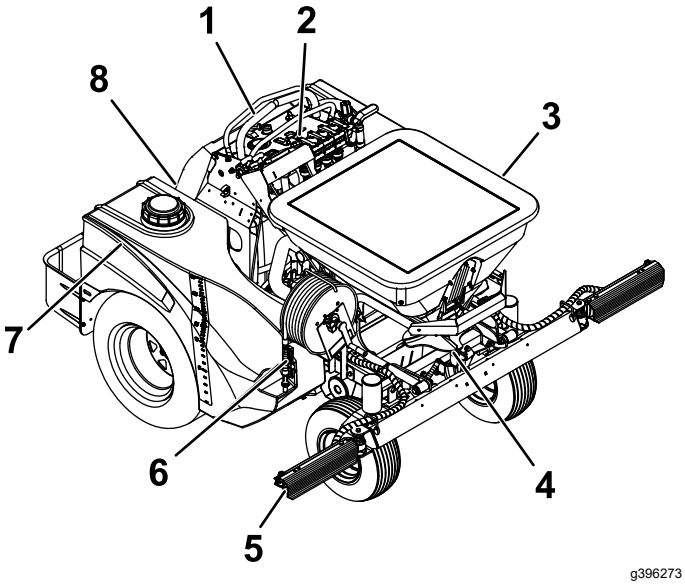


decal146-0162

146-0162

1. Spray pressure decrease
2. Spray pressure increase
3. Left nozzle spray-Off
4. Left nozzle spray-On
5. Center nozzle spray-Off
6. Center nozzle spray-On
7. Right nozzle spray-Off
8. Right nozzle spray-On
9. Spray wand pressure control-Off
10. Spray wand pressure control-On
11. Park brake-Off
12. Park brake-On
13. Choke-On
14. Choke-Off
15. Throttle-Fast
16. Continuous variable setting
17. Throttle-Slow
18. Fast
19. Slow
20. Neutral
21. Reverse
22. Warning—Read the *Operator's Manual*; Do Not operate this machine unless you are trained. Wear hearing protection.
23. Thrown object hazard-Keep bystanders away.
24. Warning-Stay away from moving parts; keep all guards in place. Stop engine and remove key before adjusting, servicing, or cleaning.
25. Warning-Disengage sprayer controls, move drive lever to neutral position, engage parking brake, and stop engine before leaving the operator's position.
26. Caustic liquid/chemical burn and toxic gas inhalation hazards-Wear hand, skin, eye, and respiratory protection.
27. Warning-Use fresh, clean water:
    - for first-aid washing
    - for rinsing the tank.
28. Crushing/dismemberment hazard of bystanders — Do Not carry passengers, look behind and down when reversing.
29. Tipping hazard-operate across slopes not up and down. Loads may shift on slopes or when turning. Do Not operate on wet slopes–use extreme caution when operating on slopes.
30. Tipping hazard—Do Not use dual ramps when loading onto a trailer; use one ramp wide enough for the machine; back up the ramp when loading the machine and drive forward off the ramp when unloading.
31. Tipping hazard—Do Not use the machine near drop-offs or on slopes; stay at least two widths of the machine away from drop-offs.
32. On
33. Spray pump switch
34. Off
35. Engine-Off
36. Engine-On
37. Engine-Start
38. Spreader motor speed - Slow - Narrow material distribution
39. Spreader motor speed - Fast - Wide material distribution

Product Overview



g396273

Figure 3

1. Reference bar
2. Motion-control levers
3. Hopper
4. Spreader impeller
5. Sprayer nozzles
6. Sprayer wand
7. Sprayer tank
8. Fuel-tank cap (behind knee pad)

Controls

Become familiar with all the controls before you start the engine and operate the machine.

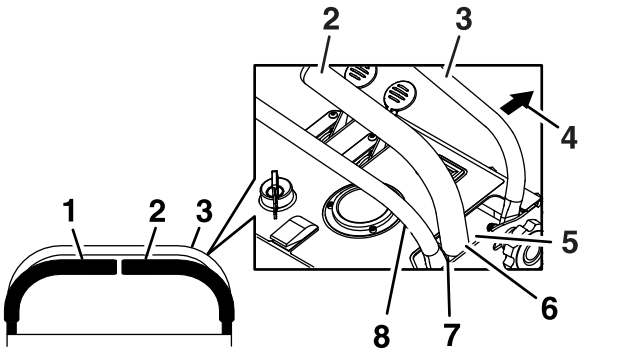
Machine Controls

Become familiar with all the controls before starting the engine and operating the machine.

Motion Control Levers

The motion control levers, located on each side of the top console, control the forward and reverse motion of the machine.

Moving the levers forward or backward turns the wheel on the same side forward or reverse respectively. Wheel speed is proportional to the amount the lever is moved.



g386917

Figure 4

1. Left motion-control lever
2. Right motion-control lever
3. Front reference/speed control bar
4. Front of the machine
5. Forward
6. Neutral
7. Reverse
8. Rear reference bar

Note: If the motion control lever does not return to the neutral position when released, contact an Authorized Service Dealer.

Choke Control

Located in the center of the control console (Figure 5).

The choke is used to aid in starting a cold engine. Moving the choke lever forward will put the choke in the ON position and moving the choke lever to the rear, to the detent, will put the choke in the OFF position. Do not run a warm engine with choke in the ON position.

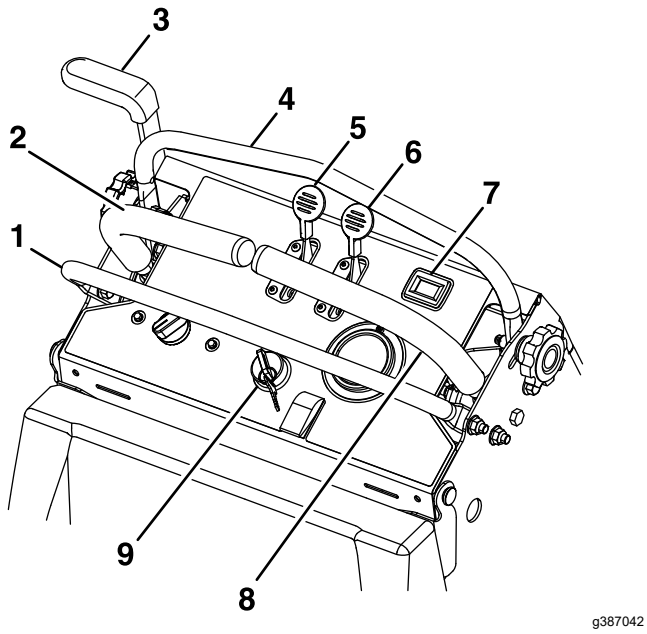


Figure 5

1. Rear reference bar
2. Left motion-control lever
3. Parking-brake lever
4. Front reference/speed control bar
5. Choke control
6. Throttle control
7. Hour meter
8. Right motion-control lever
9. Ignition switch

Throttle Control

Located in the center of the control console (Figure 5).

The throttle is used to control engine speed. Moving the throttle lever forward will increase engine speed and moving the throttle lever to the rear will decrease engine speed. Moving the throttle forward into the detent is full throttle.

Parking-Brake Lever

Located on the left side of the control console (Figure 5).

The brake lever engages a parking brake in the transaxle.

Pull the lever rearward to engage the brake.

Push the lever forward to disengage the brake.

When parking on a steep slope, the wheels must be chocked or blocked in addition to the brake being engaged. The machine must be tied down and brake engaged when transporting.

Ignition Switch

Located in the center of the control console (Figure 5).

The ignition switch is used to start and stop the engine. The switch has three positions OFF, ONand START. Insert key into switch and rotate clockwise to the ON position. Rotate clockwise to the next position to engage the starter (key must be held against spring pressure in this position). Allow the key to return to the ON position immediately after the engine starts.

Note: The parking brake must be engaged and the motion-control levers in neutral to start the engine.

Hour Meter

Located to the right of the throttle (Figure 5).

The hour meter is connected to a charge circuit installed in the engine block and it records the number of hours that the engine has run. If ignition switch is left on without engine running, the hour meter will not run.

Impeller-Speed Control

Located on the left side of the control console (see Figure 6).

Rotate the knob clockwise to start the impeller and to increase the speed and pattern width. Rotate the knob counterclockwise to decrease speed, pattern width, and to turn the impeller off.

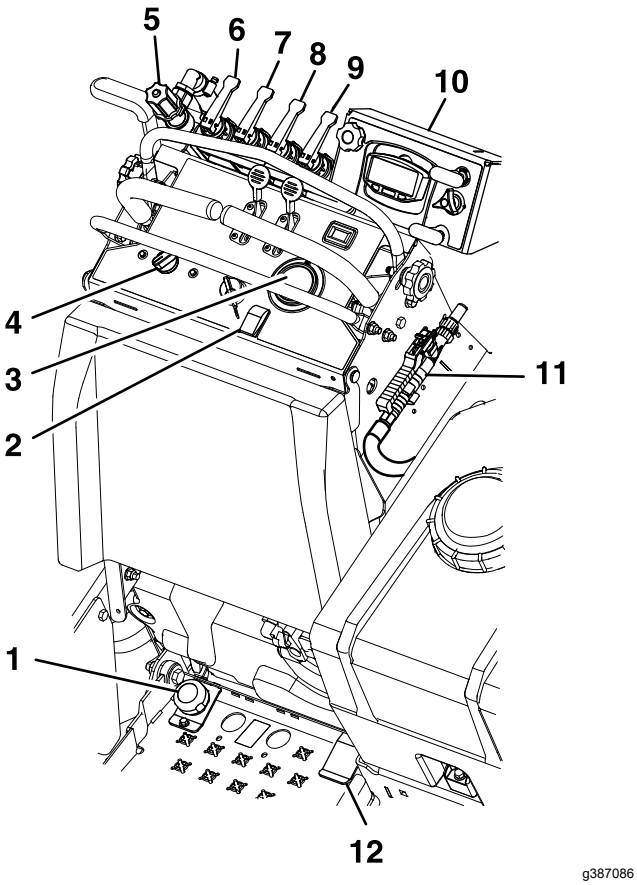


Figure 6

1. Spray pump foot button
2. Spray system switch
3. Spray pressure gauge
4. Impeller-speed control
5. Spray pressure control knob
6. Left nozzle spray lever On/Off
7. Center nozzle spray lever On/Off
8. Right nozzle spray lever On/Off
9. Spray wand spray lever On/Off
10. Hopper console
11. Spray wand trigger and lock
12. Caster wheel lock foot pedal

Stall Protection Reset:

The impeller speed control has a stall protection to prevent over-amperage. If the impeller stops spinning, reset it by turning the knob counterclockwise to the OFF position and wait five seconds before restarting.

Spray System Switch

Located to the right of the ignition switch.

Push on the top of the switch to turn on the spray system pump. Push the bottom of the switch to turn the sprayer OFF. Once the pump is turned on, the spray pressure control knob is turned clockwise to increase pressure and/or counter-clockwise to release pressure (and create agitation if the pump is on). The pressure can be read on the spray pressure gauge (decreasing pressure from gauge will increase agitation in the tank).

Spray Pump Foot Button

Located on the left side of the operator platform.

Press and hold the foot button to turn the sprayer system pump to ON. Release the foot button to turn the sprayer system pump to OFF.

Spray Pressure Control Knob

Located on the left side of the machine.

Rotate the knob clockwise to increase pressure and counterclockwise to decrease pressure.

The pressure will be displayed on the pressure gauge. Once the nozzles are opened, there will be a slight decrease in pressure (adjust accordingly).

Spray Pressure Gauge

Located above the spray pressure switch on the control console.

Displays the spray pressure when the machine is spraying.

Digital Display Gauge

Located on the right side of the boom manifold.

Refer to the digital display User's Manual for the display information.

Left Nozzle Spray Lever

Located to the right of the spray pressure control.

Pull the lever rearward to turn it on. Push the lever forward to turn off the left nozzle spray.

Center Nozzle Spray Lever

Located to the right of the left nozzle spray lever.

Pull the lever rearward to turn it on. Push the lever forward to turn off the center nozzle spray.

Right Nozzle Spray Lever

Located to the right of the center nozzle spray lever.

Pull the lever rearward to turn it on. Push the lever forward to turn off the right nozzle spray.

Hose Reel Handle

Located in front of the right spray tank.

Rotate the handle clockwise to reel the hose in. Rotate the handle counterclockwise to release the hose.

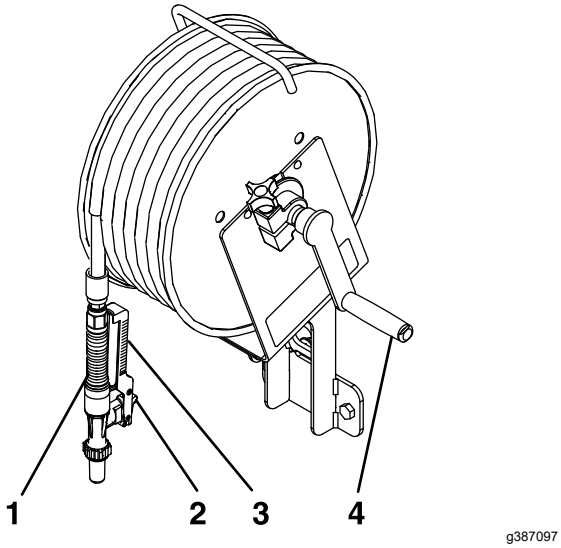


Figure 7

1. Spray wand
2. Spray wand trigger lock
3. Spray wand trigger
4. Hose reel handle

Spray Wand

Located on the right side of the tower.

Use the spray wand to spot treat small areas.

Spray Wand Trigger

Located on the bottom of the spray wand handle.

Squeeze the trigger to the handle of the spray wand to allow spray; release the trigger to stop.

Spray Wand Trigger Lock

Located on the bottom of the spray wand handle.

Squeeze the trigger to the handle of the spray wand to allow spray. Push the lock trigger forward to keep it in the open flow position. Pull the lock back to release the trigger.

Spray Wand Spray Lever

Located to the right of the right nozzle spray lever (black lever).

Pull the lever rearward to turn on the pressurized hose reel. Push the lever forward to turn off the hose reel.

Pulling the lever rearward to the On position allows liquid to flow to the hose reel for spraying out of the hand spray wand. When hose reel is not in use, be sure to push the lever forward to the Off position to prevent the wand tip from dripping.

Spray Pump Valving

Located below the knee pad.

The valving options allow product to be pulled from both tanks simultaneously or independently.

Rotate the handles counterclockwise to turn on the valves (open position) and clockwise to turn it off (close position).

Important: **Do not have both return valves in the OFF position when the pump is running.**

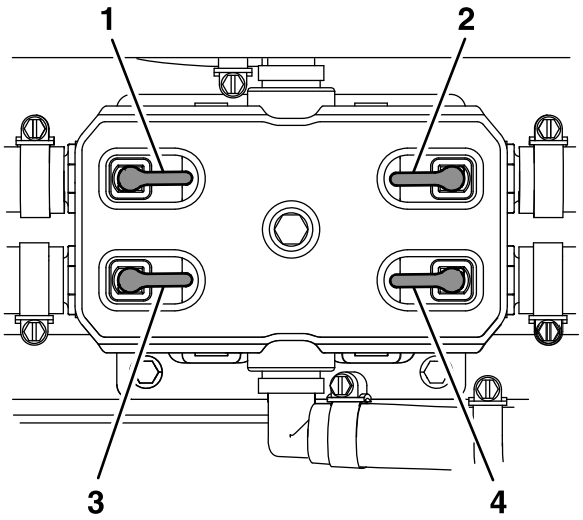


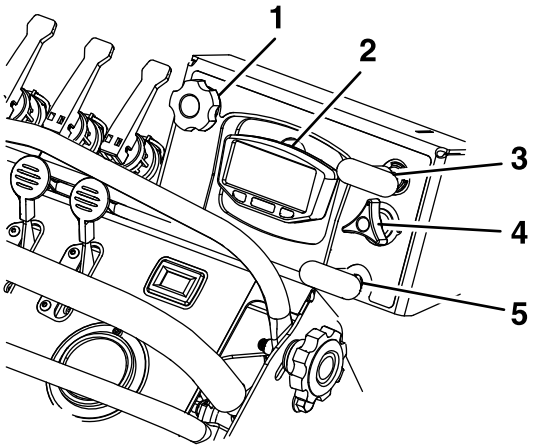
Figure 8

1. Left return
2. Right return
3. Left suction
4. Right suction

Spread Gate Open/Close

Located on the right side of the hopper console and is the top knob (see Figure 9).

Pull the handle up to open the spreader gate. Push the handle down to close the spreader gate.



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Figure 9

Hopper Console

1. Spread pattern control knob
2. Digital display gauge
3. Spread gate Open/Close
4. Rate dial
5. Deflector control

Spread Pattern Control Knob

Located on the left side of the hopper console and is the fluted knob.

This control is used if the spread pattern is skewed or dispensing too light/heavy to one side.

Rotate the knob counterclockwise if the pattern is heavy to the right.

Rotate the knob clockwise if heavy to the left.

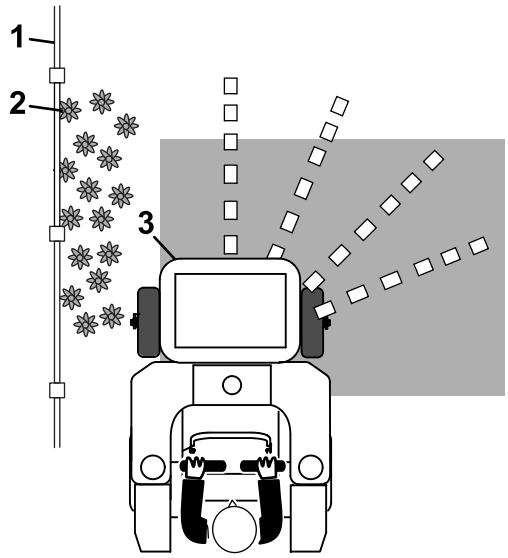
Spread Side Deflector Control

Located on the right side of the hopper console and is the bottom knob.

Use the side deflector control to temporarily stop or deflect granules away from sidewalks, parking lots, patios, or anywhere granules are not desired to be discharged from the left side of the spreader.

Push the knob down to lower the side deflector and temporarily deflect the granules.

Pull the knob up to raise the side deflector.



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Figure 10

Rate Dial

Located on the hopper console to the right of the digital display gauge (reference Figure 9).

The rate dial is used to set the amount of material to be dispensed from the hopper gate.

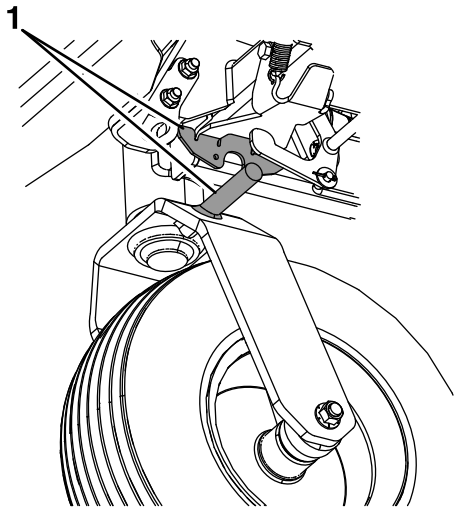
With the Spread Open/Close handle in the closed position, turn the dial to the appropriate setting. When the Spread Open/Close is pulled to the open position, the gate will open to the set position.

Note: The slot, after setting 9 on the dial, allows the hopper gate to be opened to the maximum position. This setting can be used for dry sand, ice melt, or other materials that are difficult to spread. It may also be used for hopper cleanout; to Cleaning the Spreader (page 26).

Caster Wheel Lock Foot Pedal

Located on the right side of the operator platform (see Figure 6)

Press and hold the caster wheel lock foot pedal to lock the caster wheels in the straight position. Release the foot pedal to unlock the caster wheels and allow the machine to freely turn.



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Figure 11

Drive Wheel Release Valves

⚠ WARNING

Hands may become entangled in the rotating drive components below the engine deck, which could result in serious injury or death.

Stop engine, remove key, allow all the moving parts to stop before accessing the drive wheel release valves.

⚠ WARNING

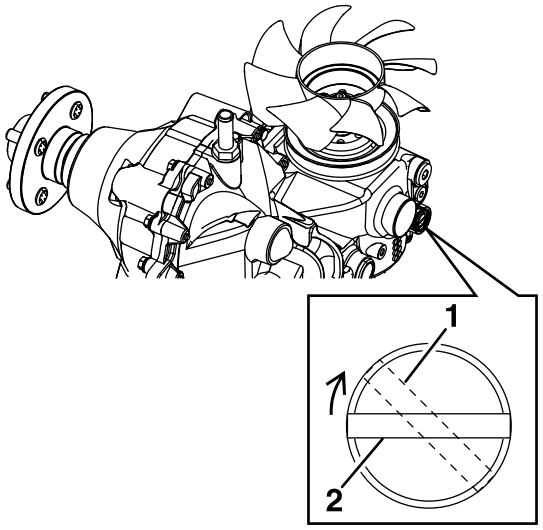
The engine and hydraulic drive units can become very hot. Touching a hot engine or hydraulic drive units can cause severe burns.

Allow the engine and hydraulic drive units to cool completely before accessing the drive wheel release valves.

Located on the inboard side towards the front of the transaxle, which is in front of the Operator platform.

During normal operating conditions, the drive wheel release valves are positioned horizontal in the Run (operate) position.

If the machine has to be pushed by hand, the valves must be in the Bypass (released) position.



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Figure 12

1. Slot in Bypass (released) position
2. Slot in Run (operating) position

To release the drive system (see item 1 in Figure 12), rotate the slot a quarter-turn clockwise.

To reset the drive system (see item 2 in Figure 12), rotate the slot a quarter-turn counterclockwise.

Specifications

Overall width	46-inch sprayer: 117 cm (46 inches)	
	52-inch sprayer: 132 cm (52 inches)	
Overall length	46-inch sprayer: 185 cm (73 inches)	
	52-inch sprayer: 183 cm (72 inches)	
Overall height	127 cm (50 inches)	
Weight	Sprayer tank and hopper empty	46-inch sprayer: 406 kg (896 lb)
		52-inch sprayer: 414 kg (912 lb)
	Only hopper full	46-inch sprayer: 520 kg (1,146 lb)
		52-inch sprayer: 527 kg (1,162 lb)
	Only sprayer tanks full	46-inch sprayer: 558 kg (1,230 lb)
		52-inch sprayer: 640 kg (1,412 lb)
	Sprayer and hopper full with 2 bags of granular	46-inch sprayer: 717 kg (1,580 lb)
		52-inch sprayer: 799 kg (1,761 lb)
Maximum machine weight	Loaded machine + operator	46-inch sprayer: 953 kg (2,100 lb)
		52-inch sprayer: 953 kg (2,100 lb)
Hopper capacity	113 kg (250 lb)	
Spreader cast	0.9 to 7.6 m (3 to 25 ft)	
Sprayer tank capacity	46-inch sprayer: 151 L (40 US gallon)	
	52-inch sprayer: 227 L (60 US gallon)	
Maximum ground speed	Forward: 16 km/h (10 mph)	
	Reverse: 8 km/h (5 mph)	

Operation

Note: Determine the left and right sides of the machine from the normal operating position.

Before Operation

Before Operation Safety

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by Toro.
- Inspect the area where the machine is to be used and remove all rocks, toys, sticks, wires, bones, and other foreign objects. These can be contaminated by chemicals, thrown, or interfere with the operation of the machine and may cause personal injury to the operator or bystanders.
- This machine was designed for one operator only. Do not carry passengers.
- Wear appropriate personal protective equipment such as safety glasses, long pants, substantial slip-resistant footwear, and hearing protection. Tie back long hair and avoid loose clothing and loose jewelry which may get tangled in moving parts.
- This machine produces sound levels in excess of 85dBA at the operator's ear and can cause hearing loss through extended periods of exposure. Wear hearing protection when operating this machine.
- Check that the following items are in place and in proper working condition: the operator presence controls, safety switches, guards, and shields. Do not operate the machine unless they are in proper working condition. Replace worn or deteriorated parts with genuine Toro parts when necessary.

⚠ DANGER

It is essential that operator safety mechanisms be connected and in proper operating condition prior to use.

Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position. When the key is turned to the OFF position, the engine should shut off. If not, stop using the machine immediately and contact an Authorized Service Dealer.

- Do not operate the machine when people, especially children, or pets are in the area. Shut off the machine and attachment(s) if anyone enters the area.
- Do not operate the machine without the safety devices in place and in proper working condition. Components are subject to wear, damage and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check for worn or deteriorating components and replace them with the manufacturer's recommended parts when necessary.
- Do not fill, calibrate, or clean the machine when people, especially children, or pets are in the area.
- Check all sprayer components for wear and leaks before applying pressure to the system. Do not use if leaking or damaged.
- Make sure the operator platform is clean and free from chemical residue and debris buildup.

Chemical Safety

⚠ WARNING

Chemical substances used in the spreader-sprayer system may be hazardous and toxic to you, bystanders, animals, plants, soils or other property.

- **Carefully read and follow the chemical warning labels and Material Safety Data Sheets (MSDS) for all chemicals used and protect yourself according to the chemical manufacturer's recommendations. Ensure that as little skin as possible is exposed while using chemicals. Use appropriate Personal Protective Equipment (PPE) to guard against personal contact with chemicals, such as:**

  – safety glasses, goggles, and/or face shield

  – chemical resistant gloves

  – rubber boots or other substantial footwear

  – hearing protection

  – respirator or filter mask

  – clean change of clothes, soap, and disposable towels, to be kept on-hand, in the event of a chemical spill.

- **Keep in mind that there may be more than one chemical used, and information on each chemical should be assessed.**
- **Refuse to operate or work on the spreader-sprayer if this information is not available!**
- **Before working on a spreader-sprayer system, make sure that the system has been triple rinsed and neutralized according to the recommendations of the chemical manufacturer(s) and all of the valves have been cycled three times.**
- **Verify there is an adequate supply of clean water and soap nearby, and immediately wash off any chemicals that contact you.**

Fuel Safety

⚠ DANGER

Gasoline is extremely flammable and vapors are explosive.

A fire or explosion from gasoline can burn you, others, and cause property damage.

- **Fill the fuel tank outdoors on level ground, in an open area, when the engine is cold. If fuel is spilled, do not attempt to start the engine. Move away from the area of the spill and avoid creating any source of ignition until fuel vapors have dissipated.**
- **Do not refill the fuel tank or drain the machine indoors or inside an enclosed trailer.**
- **Never smoke when handling gasoline, and stay away from an open flame or where gasoline fumes may be ignited by spark.**
- **Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel when engine is running or when the engine is hot.**
- **Store gasoline in an approved container and keep it out of the reach of children.**
- **Do not operate without entire exhaust system in place and in proper working condition.**

⚠ CAUTION

Refueling engine is difficult especially when using a larger refueling container—19 L (5 US gallons).

When refueling, it is recommended to:

- **Use a smaller container—4-8 L (1-2 US gallons).**
- **Use a funnel.**
- In certain conditions during fueling, static electricity can be released causing a spark which can ignite gasoline vapors.
  - Do not fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground and away from your vehicle before filling.
  - When practical, remove gas-powered equipment from the truck or trailer and refuel the equipment with its wheels on the ground. If this is not possible, then refuel such equipment

on a truck or trailer from a portable container, rather than from a gasoline dispenser nozzle.

  – If a gasoline dispenser nozzle is used, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock open device.

- Do not overfill the fuel tank. Fill the fuel tank to the bottom of the filler neck. The empty space in the tank allows gasoline to expand. Overfilling may result in fuel leakage or damage to the engine or emission system.
- Gasoline is harmful or fatal if swallowed. Long-term exposure to vapors may cause serious injury and illness.
  – Avoid prolonged breathing of vapors.
  – Keep face away from nozzle and gas tank/container opening.
  – Keep away from eyes and skin.
- To help prevent fires:
  – Keep engine and engine area free from accumulation of grass, leaves, excessive grease or oil, and other debris which can accumulate in these areas.
  – Clean up oil and fuel spills and remove fuel soaked debris.
  – Allow the machine to cool before storing the machine in any enclosure. Do not store the machine or fuel container, or refuel, where there is an open flame, spark, or pilot light such as on a water heater or other appliance.

Fuel Specification

Petroleum fuel	Use unleaded gasoline with an octane rating of 87 or higher ((R+M)/2 rating method).
Ethanol blended fuel	Use of an oxygenated, unleaded-gasoline blend with up to 10% ethanol (gasohol) or 15% MTBE (methyl tertiary butyl ether) by volume is acceptable. Ethanol and MTBE are not the same. Do not use ethanol blends of gasoline (such as E15 or E85) with more than 10% ethanol by volume. Performance problems and/or engine damage may result which may not be covered under warranty.

Important: **For best results, use only clean, fresh fuel (less than 30 days old).**

- Do not use gasoline containing methanol.
- Do not store fuel either in the fuel tank or fuel containers over the winter unless you use a fuel stabilizer.
- Do not add oil to gasoline.

During Operation

During Operation Safety

General Safety

The operator must use their full attention when operating the machine. **Do not** engage in any activity that causes distractions; otherwise, injury or property damage may occur.

⚠ WARNING

Operating engine parts, especially the muffler, become extremely hot. Severe burns can occur on contact and debris, such as leaves, grass, brush, etc. can catch fire.

Clean the machine as stated in the Maintenance section. Keep engine and engine area free from accumulation of grass, leaves, excessive grease or oil, and other debris which can accumulate in these areas.

⚠ CAUTION

Chemicals are hazardous and can cause personal injury.

- **Read the directions on the chemical labels before handling the chemicals and follow all manufacturer recommendations and precautions.**
- **Keep chemicals away from your skin. Should contact occur, wash the affected area thoroughly with soap and clean water.**
- **Wear goggles, gloves, and any other protective equipment recommended by the chemical manufacturer.**

- Operate the engine only in well-ventilated areas. Exhaust gases contain carbon monoxide, which is an odorless deadly poison.
- Do not operate the machine while ill, tired, or under the influence of alcohol or drugs.
- Operate the machine only in good visibility and appropriate weather conditions. Do not operate the machine when there is the risk of lightning.
- Keep away from holes, ruts, bumps, rocks, and other hidden hazards. Use care when approaching blind corners, shrubs, trees, tall grass or other objects that may hide obstacles or obscure vision. Uneven terrain could overturn the machine.

- Start the engine with your feet well away from the spreader or spray nozzles.
- Be aware of weather conditions and check that spray nozzles, patterns, and volume are suitable.
- Do not operate the machine without all safety shields, guards, switches, and other devices in place and in proper working condition.
- Keep clear of the discharge area at all times.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with engine running.
- Be aware of the spreading/spraying path and direct discharge away from others. Avoid discharging material against a wall or obstruction as the material may ricochet back toward the operator.
- Be alert, slow down and use caution when making turns. Do not operate in reverse unless absolutely necessary. Always look down and behind you before moving the machine in reverse.
- Stop spreading/spraying when making tight turns to minimize uneven distribution pattern, application rate, and chemical drift.
- Chemicals may drift and cause injury to people and animals. It may also damage plants, soil, or other property.
- Park the machine on level ground. Stop engine, wait for all moving parts to stop, and remove the key.
  - Before checking, cleaning or working on the machine.
  - After striking a foreign object or an abnormal vibration occurs (inspect the machine for damage and make repairs before restarting and operating the machine).
  - Before clearing blockages.
  - Whenever you leave the machine. Do not leave a running machine unattended.
- Stop the engine, wait for all moving parts to stop:
  - Before refueling.
- Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the machine and the spreading/spraying activity. Never assume that children will remain where you last saw them.
  - Keep children out of the working area and under the watchful care of another responsible adult, not the operator.
  - Be alert and turn the machine off if children enter the area.
  - Before and while backing or changing direction, look behind, down, and side-to-side for small children.
  - Never allow children to operate the machine.
  - Do not carry children, even with the spreading/spraying shut off. Children could fall off and be seriously injured or interfere with the safe operation of the machine. Children that have been given rides in the past could suddenly appear in the working area for another ride and be run over or backed over by the machine.
- Reduce the weight of the load when operating on hills and rough terrain to avoid tipping or overturning of the machine.
- Liquid loads and granular materials can shift. This shifting happens most often while turning, going up or down hills, suddenly changing speeds, or while driving over rough surfaces. Shifting loads can cause the machine to tip over.
- When operating with a heavy load, reduce your speed and allow for sufficient stopping distance. Use extra caution on slopes.
- Reduce speed and load when operating on rough terrain, uneven ground, and near curbs, holes, and other sudden changes in terrain. Loads may shift, causing the sprayer to become unstable.

⚠ WARNING

Sudden changes in terrain may cause abrupt steering wheel movement, possibly resulting in hand and arm injuries.

Reduce speed when operating on rough terrain or near curbs.

- Safely relieve liquid from spray wand every time engine is turned off.

⚠ WARNING

Spray wand traps liquids under high pressure, even when engine is off. High pressure spray discharge could cause serious injury or death.

- **– Keep clear of nozzle and do not direct spray or stream at people, pets, or non-work area property.**
- **– Do not direct spray on or near electrical power components or source.**
- **– Do not repair spray wand, hoses, seals, nozzle, or other wand components; replace them.**
- **– Do not attach hoses or other components to the end of the spray wand nozzle.**
- **– Do not attempt to disconnect the spray wand from the machine while the system is pressurized.**
- **– Do not use spray wand if trigger lock is damaged or missing.**
- **– Do not keep spray wand in locked-open position when job is complete.**

- When draining or relieving system, do not let anyone stand in front of nozzles and do not drain on a person's feet.

Slope Safety

- Slopes are a major factor related to loss of control and rollover accidents, which can result in severe injury or death. The operator is responsible for safe slope operation. Operating the machine on any slope requires extra caution. Before using the machine on a slope, the operator must:
  - – Review and understand the slope instructions in the manual and on the machine.
  - – Evaluate the site conditions of the day to determine if the slope is safe for machine operation. Use common sense and good judgment when performing this evaluation. Changes in the terrain, such as moisture, can quickly affect the operation of the machine on a slope.
- Operate across slopes, never up and down. Avoid operation on excessively steep or wet slopes.
- Identify hazards at the base of the slope. Do not operate the machine near drop-offs, ditches, embankments, water or other hazards. The machine could suddenly roll over if a wheel goes over the edge or the edge collapses. Keep a safe distance (twice the width of the machine) between the machine and any hazard. Use a walk-behind machine or a handheld tool to operate in these areas.

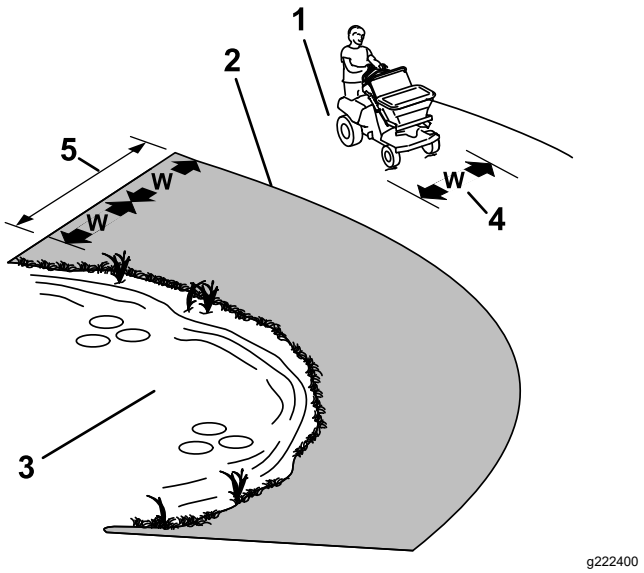


Figure 13

1. Safe Zone — Use the machine here
2. Danger Zone - Use a walk-behind machine or a hand held tool near drop-offs, ditches, embankments, water or other hazards.
3. Water
4. W=width of the machine
5. Keep a safe distance (twice the width of the machine) between the machine and any hazard.

- Avoid starting, stopping or turning the machine on slopes. Avoid making sudden changes in speed or direction; turn slowly and gradually.
- Do not operate a machine under any conditions where traction, steering or stability is in question. Be aware that operating the machine on wet grass, across slopes or downhill may cause the machine to lose traction. Loss of traction to the drive wheels may result in sliding and a loss of braking and steering. The machine can slide even if the drive wheels are stopped.
- Remove or mark obstacles such as ditches, holes, ruts, bumps, rocks or other hidden hazards. Tall grass can hide obstacles. Uneven terrain could overturn the machine.
- Use extra care while operating with accessories or attachments. These can change the stability of the machine and cause a loss of control. Follow directions for counter weights.
- If you lose control of the machine, step off and away from the direction of travel of the machine.

Operating the Machine

Starting the Engine

1. Leave the motion control levers in neutral and engage the parking brake.
2. Set the throttle to the FAST position.
3. On a cold engine, push the choke lever forward into the ON position.

   On a warm engine, leave the choke in the OFF position.
4. Turn ignition switch to the START position. Release the switch as soon as the engine starts.

   Important: **Do not crank the engine continuously for more than ten seconds at a time. If the engine does not start, allow a 60 second cool-down period between starting attempts. Failure to follow these guidelines can burn out the starter motor**

   Engine may be difficult to start in temperatures under -1 °C (30°F).
5. If the choke is in the ON position, gradually return choke to the OFF position as the engine warms up.

Stopping the Engine

1. Move the motion control levers back to the neutral position and bring the machine to a full stop.
2. Engage the parking brake.
3. Place the throttle midway between the SLOW and FAST positions.
4. Allow the engine to run for a minimum of 15 seconds, then turn the ignition switch to the OFF position to stop the engine.
5. Remove the key to prevent children or other unauthorized persons from starting the engine.

Driving the Machine

⚠ CAUTION

Machine can spin very rapidly by positioning one lever too much ahead of the other. Operator may lose control of the machine, which may cause damage to the machine or injury.

- **Use caution when making turns.**
- **Slow the machine down before making sharp turns.**

Important: **To begin movement (forward or backward), the brake lever must be disengaged (pushed forward) before the motion control lever can be moved.**

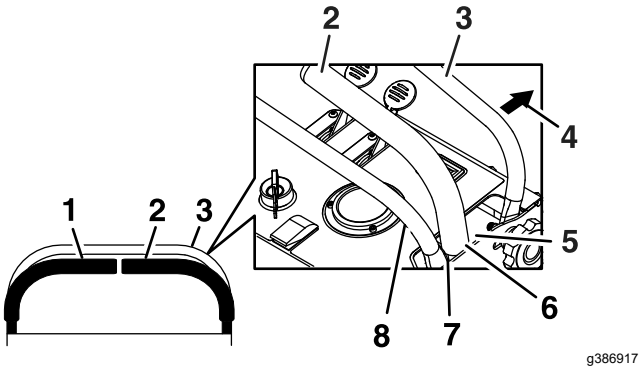


Figure 14

1. Left motion-control lever
2. Right motion-control lever
3. Front reference/speed control bar
4. Front of the machine
5. Forward
6. Neutral
7. Reverse
8. Rear reference bar

Driving Forward

1. Make sure the motion control lever is in the neutral position.
2. Release the parking brake.
3. To move forward in a straight line, move both levers forward with equal pressure.

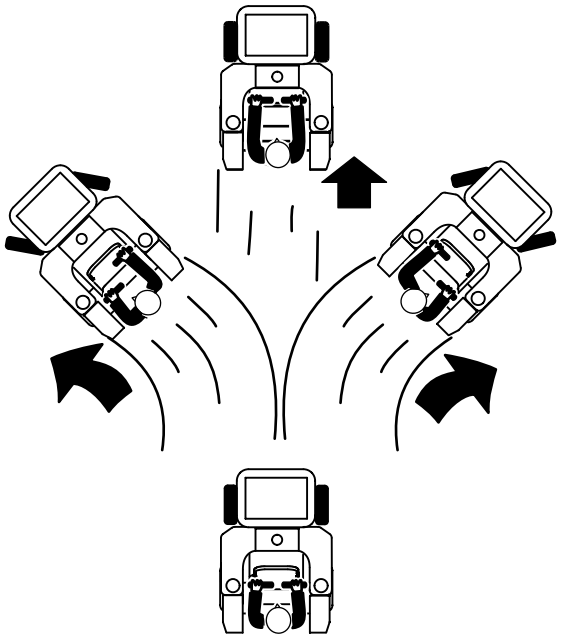


Figure 15

To turn left or right, pull the motion control lever back toward neutral in the desired turn direction.

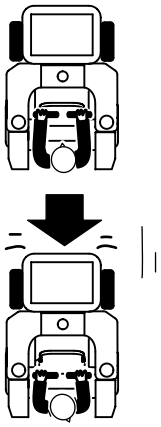
The machine will move faster the farther the motion control lever is moved from the neutral position.

4. To stop, position both motion control levers in the neutral position; releasing the lever will automatically return it to neutral.

   Note: Stopping distance may vary depending on the spreader-sprayer load.

Driving in Reverse

1. Move the motion control lever to the neutral position.
2. To move rearward in a straight line, slowly move both levers rearward with equal pressure.



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Figure 16

   To turn left or right, release pressure on the motion control lever toward the desired turn direction.

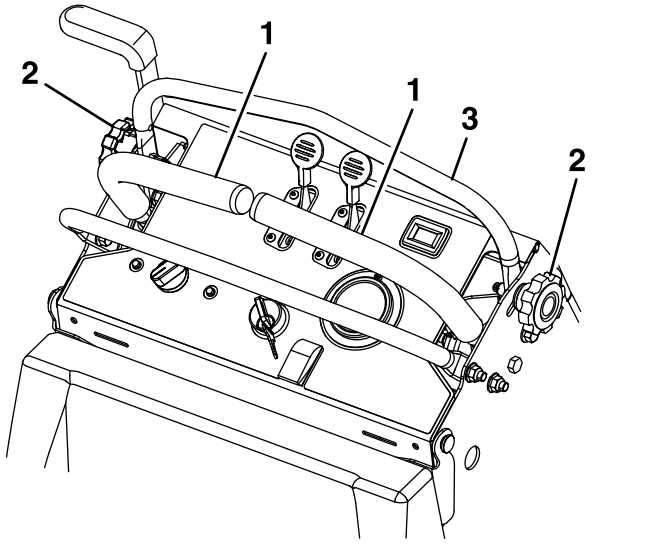
3. To stop, position both motion control levers in the neutral operate position.

   Note: Stopping distance may vary depending on the spreader-sprayer load.

Adjusting the Front Reference/Speed Control Bar

Adjust the front reference/speed control bar for desired maximum forward speed.

1. Stop the machine and move the motion control levers to the neutral position.
2. Loosen the knobs on both sides of the control tower.



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Figure 17

1. Motion-control levers
2. Adjustment knob
3. Front reference/Speed control bar

3. Move the bar forward to obtain the fastest speed.

   Move the bar backward to obtain the slowest speed.

4. On both sides, tighten the knobs.

Important: **Make sure the knobs are tight so the front reference/speed control bar does not move during operation.**

Changing the Platform Suspension

The rubber isolators under the operator platform can be adjusted to make the ride softer or harder. There are three positions: front, middle, and rear.

To make the ride softer move the isolators to the front position.

To make the ride stiffer move the isolators to the rear position.

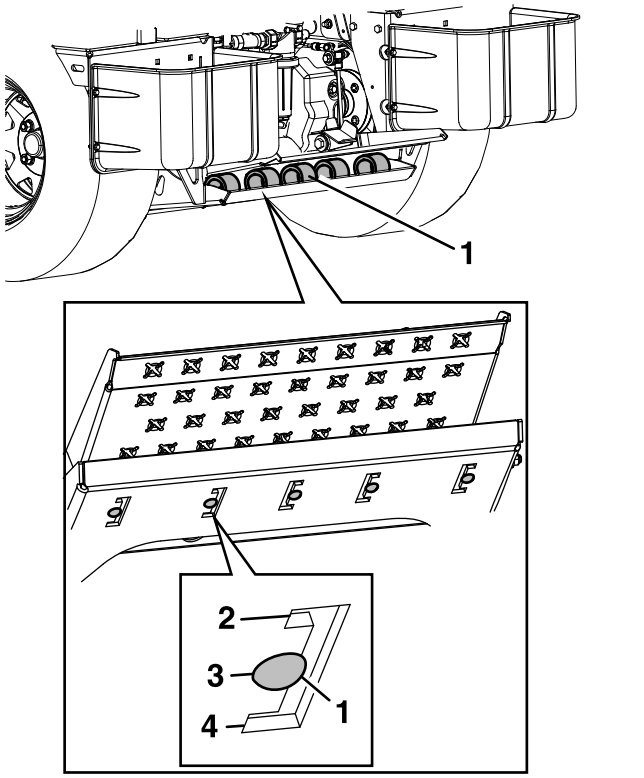


Figure 18

1. Rubber isolator
2. Rear position
3. Middle position
4. Front position

Operating the Spreader

The spreader disperses free-flowing granular substances such as grass seed, fertilizer, ice melt, etc. When using the spreader, first fill the granule hopper, then apply to the work area, and finally clean the hopper. It is important to complete all three of these steps to avoid damaging the spreader.

Note: Clean your spreader thoroughly after all applications.

Before Operating the Spreader

Some chemicals are more aggressive than others and each chemical interacts differently with various materials. Some consistencies (e.g. wettable powders, charcoal) are more abrasive and lead to higher than normal wear rates. If a chemical is available in a formulation that would provide increased life to the sprayer, use this alternative formulation.

Make sure the spreader has been calibrated before starting; refer to Spreader Calibration (page 27).

Important: **Verify that the proper application rate has been set prior to filling the hopper.**

Filling the Spreader Hopper

1. Stop the machine on a level surface, move motion control lever to the neutral position, stop the engine, and set the parking brake.
2. Use the Spreading Charts on the following pages to determine the rate dial setting.

   Note: If the setting is not listed for the type of material being used, place the setting at a lower value then adjust as needed.
3. Drive to the work area.
4. Stop the spreader-sprayer on a level surface, leave motion control lever in the neutral position, stop the engine, and set the parking brake.
5. Ensure that the hopper gate is closed.
6. Remove the cover from the hopper, add the material to be spread, and replace the cover.

   Note: Do not overload the hopper; refer to the Maximum Hopper Capacity in Specifications (page 17).

   Note: One extra bag of granular product may be placed in each fertilizer box; however, do not exceed the Maximum Machine Weight as stated in Specifications (page 17). Overloading the machine will shorten the life of the transmission and void the warranty.

   Note: When operating the machine, maintain a minimum of 60 lb (27 kg) in the hopper when there are 50 lb (23 kg) bags in each fertilizer box.

Spreading

Spreading Tips:

- To ensure uniform application, be sure to overlap the material distribution. The highest amount of material will dispense from the front of the hopper and less material from each side. Adjust the distribution pattern to achieve desired results.
- Watch for changes in the distribution pattern; unequal distribution may lead to striping.

Note: Make sure the machine has been calibrated properly before starting the spreading application.

1. Start the engine and place the throttle midway between the SLOW and FAST positions.
2. Set the impeller speed to the appropriate broadcast rate setting.
3. Move the throttle to the FAST position and drive forward.
4. Pull the Spread Open/Close handle up to open the hopper gate and begin spreading.

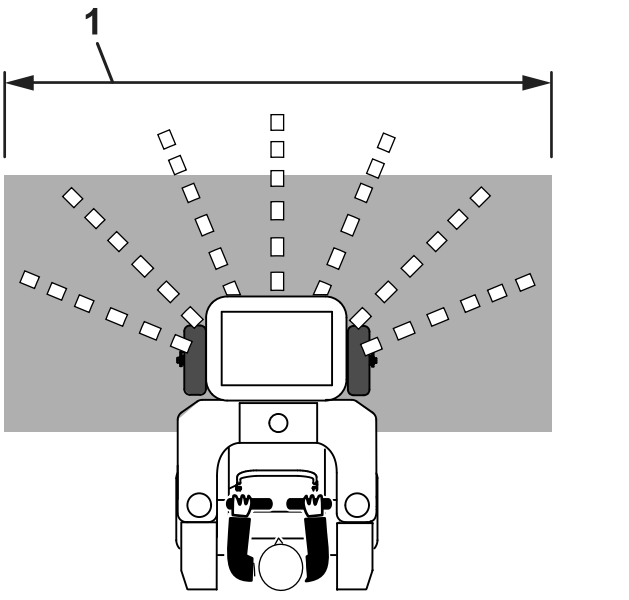


Figure 19

1. Effective spreading width—variable 0.9-7.6 m (3-25 ft)

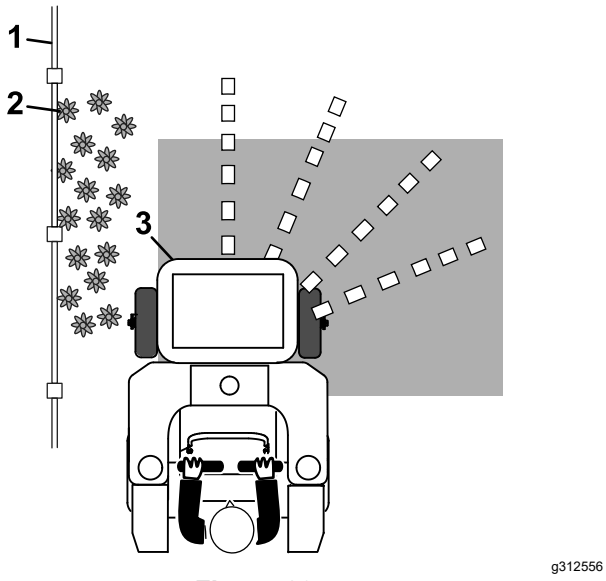


Figure 20

1. Fence
2. Flowers
3. Side deflector lowered

5. Evaluate the spread pattern. If adjustments are needed, see Spreader Pattern Adjustment (page 30).
6. When finished spreading, close the hopper gate.
7. Clean the hopper after **each** spreading session.

   Important: **Always empty and clean the spreader immediately after each use. Failure to do so may cause the chemicals to corrode the spreader and other components.**

Cleaning the Spreader

1. Drive the machine to a designated cleaning area.
2. Stop the machine on a level surface, leave the motion control lever in the neutral position, and turn off the engine. Engage the parking brake.
3. Rotate the dial past the “9” position to the maximum open position. Open the hopper gate by pulling the handle up.

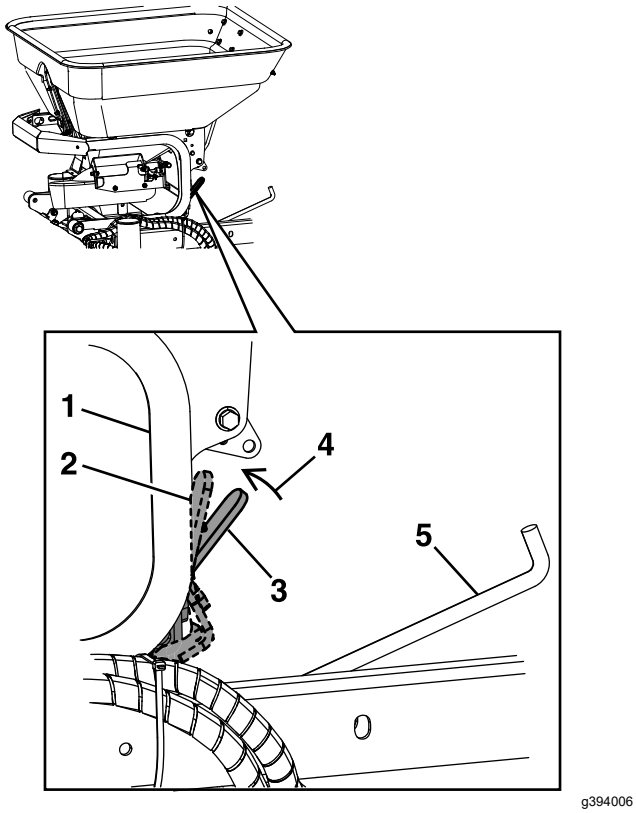
   Note: The hopper can be rotated forward to help assist with cleaning; refer to Adjusting the Hopper Position (page 26).
4. Using a garden hose, spray the inside and outside of the entire spreader with clean water.

   Note: Do not use a power washer to clean the machine. The high-pressure water may force residual corrosive materials into spreader-sprayer components.
5. When the hopper has been thoroughly rinsed and drained, close the gate.
6. Place the rate dial to a setting lower than the maximum open position.
7. Allow the spreader-sprayer to completely dry before the next use.

Adjusting the Hopper Position

- **Rotating the hopper forward**

  The hopper can be rotated forward for maintenance and cleaning. Before adjusting, make sure side deflector is in the raised position. Pull the hopper latch handle towards the hopper frame tube to unlock the latch and rotate the hopper forward. The prop rod will stop it in the forward position.



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Figure 21

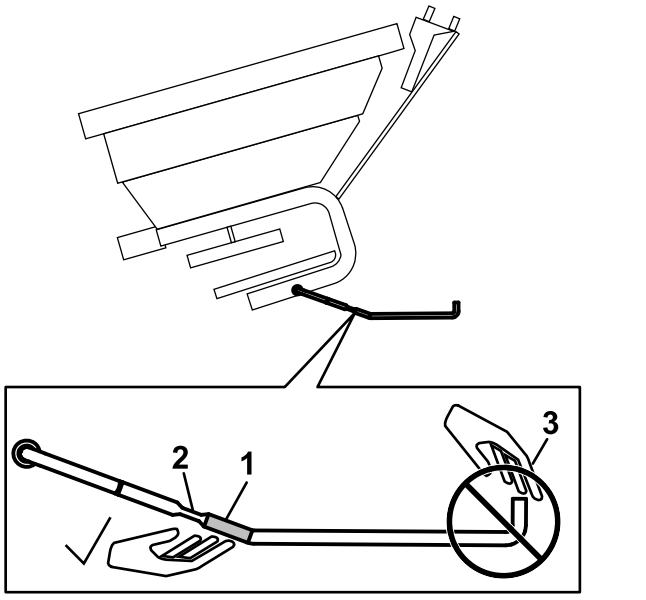
1. Hopper frame tube
2. Hopper latch handle–unlocked position
3. Hopper latch handle–locked operating position
4. Pull latch towards frame
5. Prop rod

- **Returning the hopper to the operating position**

  Slowly rotate the hopper rearward towards the engine. The prop rod has a stop that will prevent the hopper from rotating to the locked operating position.

  1. Pull the hopper slightly forward.
  2. Grab the prop rod close to the detent (see Figure 22) and lift it up towards the hopper frame.

     Important: **Do not grab the end of the prop rod located by the engine.**



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Figure 22

1. Grab here
2. Detent
3. Do Not grab end of prop rod

  3. Push down on the back of hopper until it latches and locks into place.

     Note: Make sure the hopper is securely locked in the down position before driving the machine.

Spreader Calibration

The spreader should be calibrated each time a new material is used. The spread width ranges from 0.9-7.6 m (3-25 ft) and depends on the material particle size, volume/density, and rate of travel.

Refer to the spreading charts along with Determining the Distribution Pattern (page 27), Determining the Effective Spreading Width (page 29), and Calculating the Application Rate (page 29) sections to calibrate the machine.

Determining the Distribution Pattern

Operator supplied equipment: 15 shallow collection pans and 15 graduated measuring cylinders

The most accurate method to measure the distribution is to use shallow collection pans and graduated measuring cylinders. In the example below, 15 shallow collection pans approximately 30 cm (12 inches) wide, 91 cm (36 inches) long, and 5 cm (2 inches) tall are used.

1. Make sure to allow ample driving distance before setting up the pans to ensure the machine is

traveling at the desired spreading speed before reaching the pans.

2. Place one pan in the center of the drive path. Arrange the next two pans, one on each side, far enough apart to allow ample room for the spreader drive tires to pass over the center pan.
3. Place the remaining pans in a straight line as shown in Figure 23 or Figure 24.
   - For larger granule materials:

     Space six additional pans, on each side, 30 cm (12 inches) apart as shown in Figure 23).

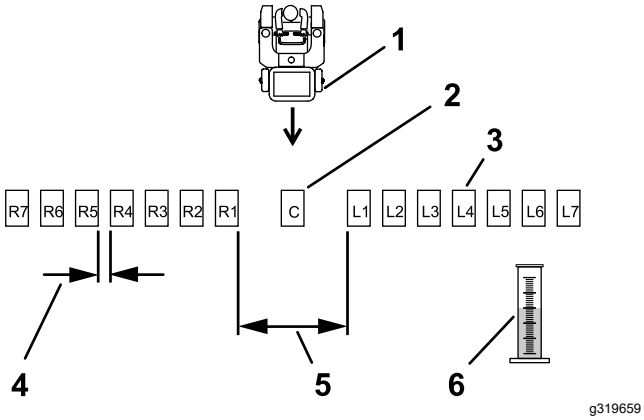


Figure 23

1. Spreader moving towards pans
2. Center pan
3. Collection pans (gap between each)
4. 30 cm (12 inches) gap
5. L1 and R1 collection pan gap (spread apart to allow machine to pass through)
6. Graduated measuring cylinder

   - For smaller granule materials:

     Place six additional pans, on each side, with no gap in between each pan (Figure 24).

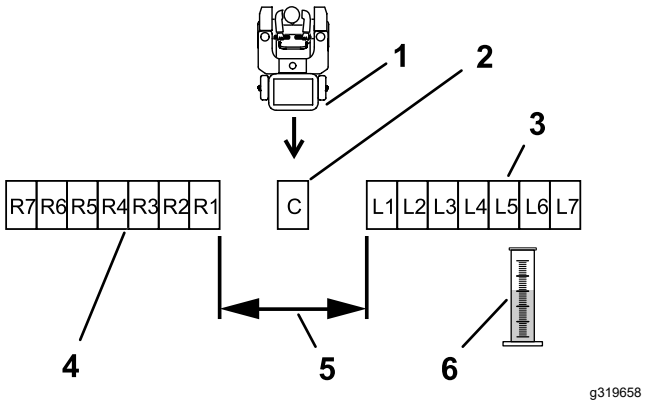


Figure 24

1. Spreader moving towards pans
2. Center collection pan
3. Left collection pans (no gap between each)
4. Right collection pans (no gap between each)
5. L1 and R1 collection pan gap (spread apart to allow machine to pass through)
6. Graduated measuring cylinder

4. Refer to the Spreading Charts (page 34) section to determine the appropriate rate dial setting.
5. Fill the hopper approximately half-full with the desired material.
6. Set the impeller speed to the appropriate broadcasting rate.
7. Pull the Spread Open/Close handle to the open position and drive the spreader, at the appropriate speed, over the center pan. Repeat this several times, moving in the same direction each time, until enough material is dispensed to fill the center graduated measuring cylinder half full.
8. Label each graduated measuring cylinder to correspond with the distribution pans (i.e. ...L2, L1, Center, R1, R2....) (refer to Figure 23 and Figure 24).
9. One at a time, take a collection pan and dump the contents into the corresponding graduated measuring cylinder. Record the amount of material collected and return the pan to its location. Repeat this until all pan contents have been emptied.
10. With the graduated measuring cylinder in the same straight line as the pans, evaluate the volume of material in each cylinder to determine the quality of the distribution from the spreader.
11. To adjust the spreader pattern, refer to Spreader Pattern Adjustment (page 30).
12. Repeat steps 5 through 11 until a uniform pattern is achieved.

Determining the Effective Spreading Width

The effective width is used to determine the uniform distribution of the material.

Note: The spreading width range is 0.9 m (3 ft) up to 7.6 m (25 ft).

1. After the spreader pattern is correctly adjusted, evaluate the amount of material in the center graduated measuring cylinder.
2. Locate the two tubes, one each side of center, that contain half the measured amount of the material that you observed in the center graduated cylinder.
3. Go to the two corresponding pans. Starting from the outer edge, measure and record the distance between left pan, through the center pan, to the outer edge of the right pan.

   Note: This measurement is the effective spreading width.

Calculating the Application Rate

1. Determine the amount of product to be applied.
2. Determine the calibration course
   A. Determine the amount of product to be spread per 93 m^2 (1,000 ft^2). Use the recommended rate from the Spreading Charts (page 34) section or the product manufacturer's label as a guide.
   B. Determine a course length by dividing by the effective spread width.

      For example, if the effective width is 1.8 m (6 ft), then the calibration course length equals 51 m (167 ft).

Course Length

$$\frac{93\ m^2\ (1{,}000\ ft^2)}{1.8\ m\ (6\ ft)} = \textbf{51 m (167 ft)}$$

   C. The calibration course is 1.8 m (6 ft) by 51 m (167 ft).
   D. Measure and visibly mark the course length. Make sure to allow ample distance before the starting marker to ensure the spreader is at full speed when crossing the first mark of the course.
3. Set the appropriate gate dial setting (refer to the Spreading Charts (page 34) section as a starting point).
4. Add material to the hopper (for example, 11.3 kg (25 lb) was added).
5. Drive the spreader over the calibration course while applying the material.
6. Empty the remaining material of the hopper into a clean bucket.
7. Weigh the bucket containing the material and record the weight. Pour the contents back into the hopper and then weigh the empty bucket. Subtract these two amounts to determine the amount of material remaining in the hopper (for example, 9 kg (20 lb) remains.)
8. Subtract the amount remaining in the hopper (step 7) from the amount originally added (step 4); the result is the amount applied to the course.

Amount Applied

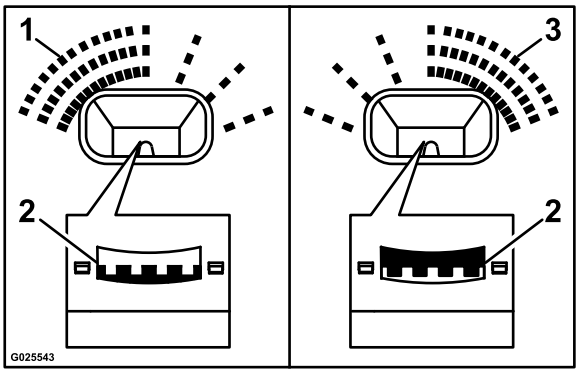
11.3 kg (25 lb) – 9 kg (20 lb) = **2.3 kg (5 lb)**

   For this example, 2.3 kg (5 lb) was applied to 93 m^2 (1,000 ft^2).
9. If necessary, adjust the rate dial to achieve the recommended amount to be applied and repeat the procedure. Once the correct application rate is achieved, repeat this procedure an additional time to verify the results.

   Note: Designate a new calibration course each time, so the turf is not damaged.

Spreader Pattern Adjustment

If the spread pattern is skewed or dispensing too light/heavy to one side (see Figure 25 and Figure 26), adjust the gate as follows:



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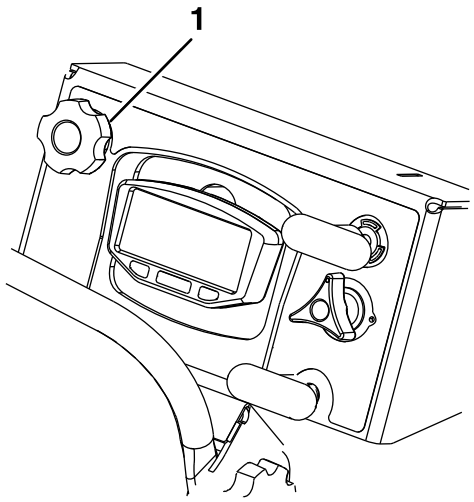
Figure 25

1. Heavy to left side
2. Move ramp pattern to shaded position
3. Heavy to right side

Note: Do not adjust the ramps to split product flow. Use only the front or rear ramp positions as shown.

To adjust when the material pattern rotate the spread pattern control knob:

- Clockwise if heavy on left side.
- Counterclockwise if heavy on right side.



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Figure 26

1. Spread pattern control knob

Spread Gate Opening Adjustment

1. Make sure the Spread Gate Open/Close knob is in the closed position.

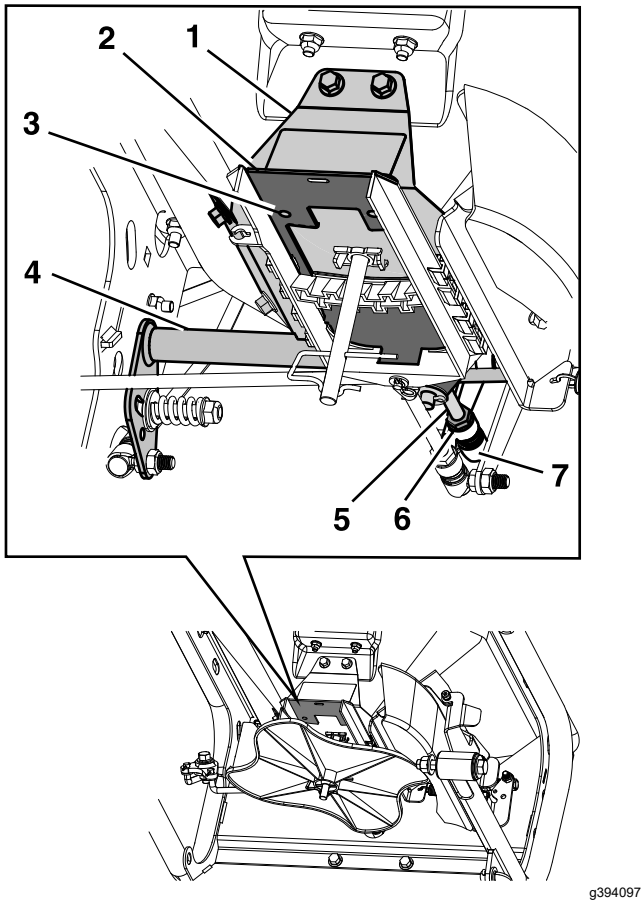


Figure 27

Rear hopper panel and spinner removed for clarity

1. Bottom hopper plate
2. Rate gate
3. Hole
4. Hopper gate crank
5. Lower gate linkage
6. Jam nut
7. Ball joint

2. Loosen the jam nut on the lower gate linkage ball joint housing and release the ball joint from the ball end.
3. Align the rate gate and the bottom hopper plate, by inserting pins through the 6.4 mm (0.25 inch) diameter holes.
4. Adjust lower gate linkage ball joint housing until it lines back up with the ball and reattach the ball joint housing to the ball.
5. Tighten the jam nut to the ball joint housing.
6. Remove the pins from step 3.

Rate Dial Tension Adjustment

The tension on the rate dial is adjustable. The nominal tension is when the compression spring measures 28 mm (1.12 inches) as shown in Figure 28.

Rotate the nut to increase or decrease tension.

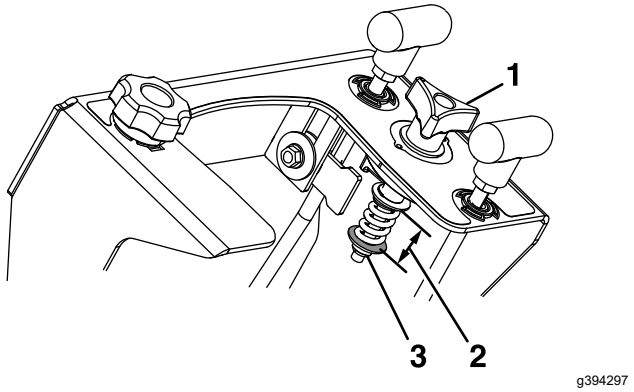


Figure 28

1. Rate dial
2. 28 mm (1.12 inches)
3. Nut

Spread Pattern Control Tension Adjustment

If the Spread Pattern Control (diffuser) will not stay in the set location, increase the tension. Tighten the nut in small increments, on the left side of the hopper assembly, to increase the tension; to decrease the tension, loosen the nut.

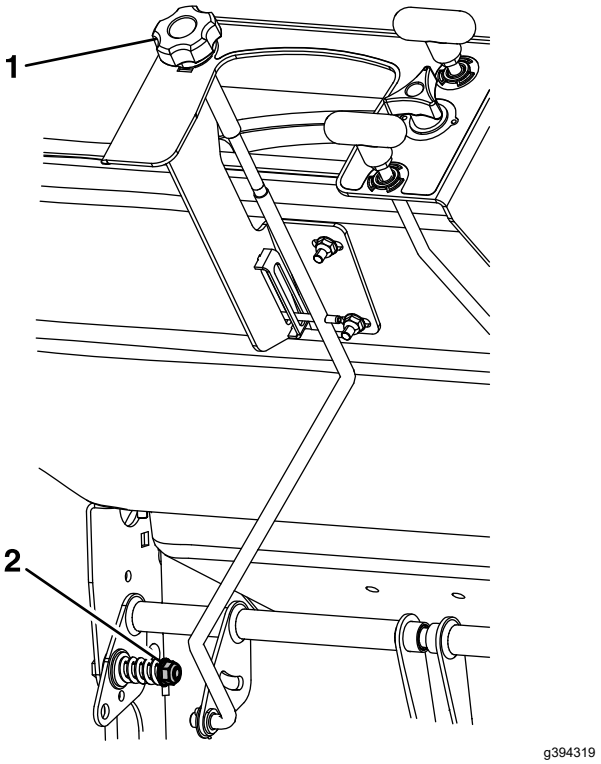


Figure 29

1. Diffuser knob
2. Nut

Spread Gate Open/Close Tension Adjustment

If the Spread Gate Open/Close linkage will not stay in the open or closed position, adjust the tension. Tighten the nut in small increments, on the right side of the hopper assembly, to increase the tension; to decrease the tension, loosen the nut.

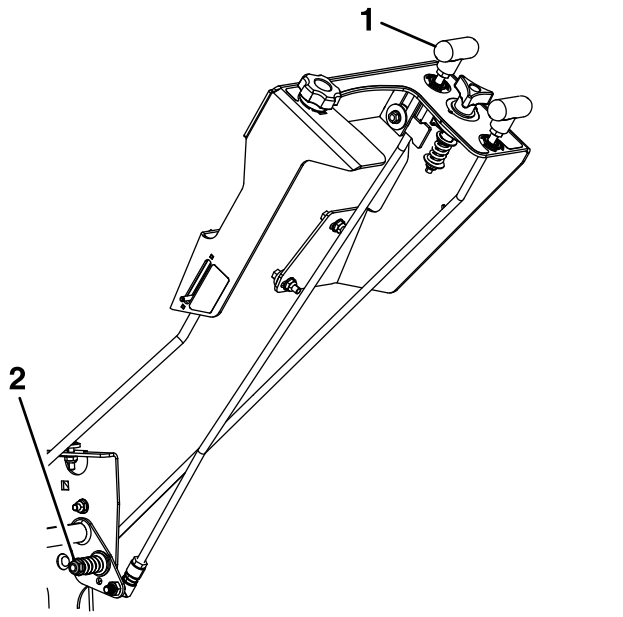


Figure 30

1. Rate gate knob
2. Nut

Spread Gate Open/Close Linkage Adjustment

If the Spread Gate Open/Close linkage will not open or close all the way, it needs an adjustment.

1. Locate the ball joint housing on the rate gate linkage on the right side of the hopper assembly.

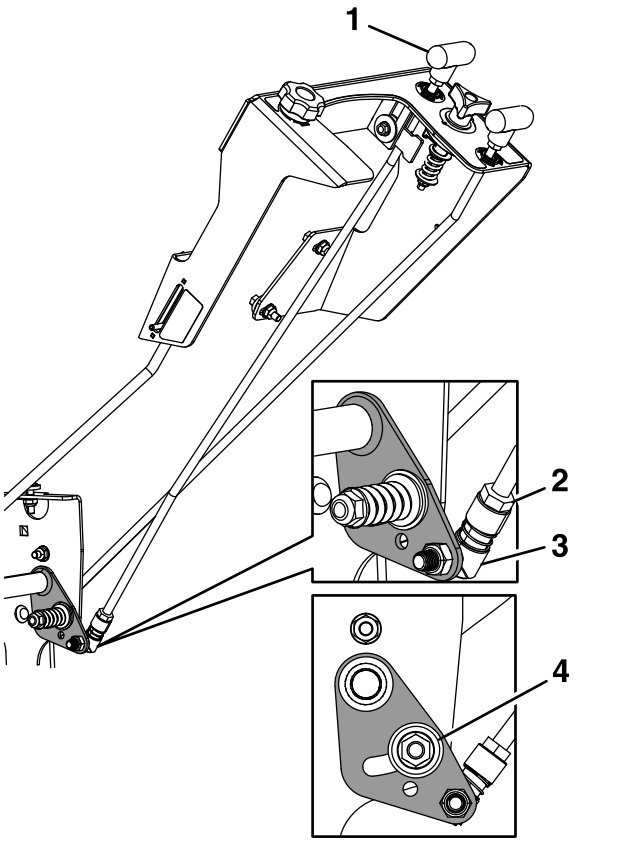
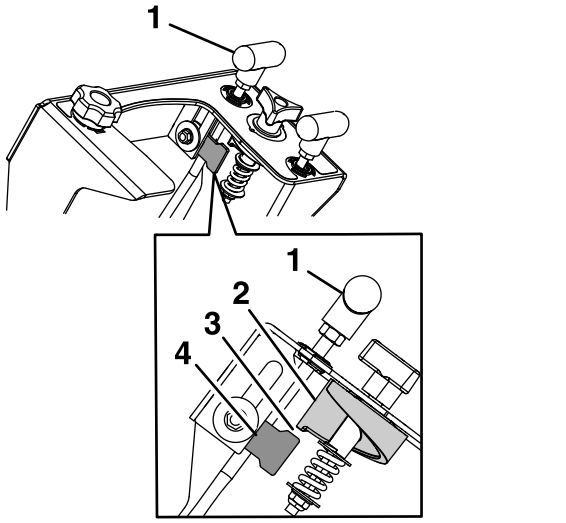


Figure 31

1. Rate gate knob
2. Jam nut
3. Ball joint housing
4. Lower bellcrank in lowest position

2. Loosen the jam nut on the ball joint housing and lift upward to release it from the ball on the lower bellcrank.
3. Push the lower bellcrank forward and down into the lowest portion of the slot.
4. Push downward on the rate gate knob and adjust the ball joint housing until it lines up with ball on the lower bellcrank.
5. Reconnect the ball joint housing to the ball.
6. Tighten the jam nut onto the ball joint housing.
7. When the adjusted correctly, there will be a gap between the rate gate stop and the bottom of the rate dial as shown in Figure 32.



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Figure 32

1. Rate gate knob
2. Bottom of the rate dial
3. Gap
4. Rate gate stop

Spreading Charts

Note: The Dial Settings chart and the Grass Seed Spreading chart are provided with permission from the Brinly-Hardy Company; reference the Brinly-Hardy Company website for more information.

These charts are to be used as an approximate guideline only. Other factors, such as weather conditions, spreader operation, and condition of materials, will affect the results.

Approximate Dial Settings			
Type	**93 m^2 (1,000 ft^2)**	**Dial Setting — One Pass**	**Dial Setting — Two Passes**
Fine Pellets	1 lb (0.45 kg)	3.6	3.1
	2 lb (0.91 kg)	4.0	3.5
	3 lb (1.36 kg)	4.2	3.7
Mixed Fine Pellets	2 lb (0.91 kg)	3.7	3.2
	4 lb (1.81 kg)	4.7	4.1
	6 lb (2.72 kg)	5.2	4.5
Small Pellets	2 lb (0.91 kg)	3	2.2
	4 lb (1.81 kg)	4.2	3.7
	6 lb (2.72 kg)	4.5	4
Nitrogen Pellets Medium Size	1 lb (0.45 kg)	3.5	3
	2 lb (0.91 kg)	4.2	3.7
	3 lb (1.36 kg)	4.7	4
Medium Pellets and Granules	2 lb (0.91 kg)	3.5	3
	4 lb (1.81 kg)	4.2	3.8
	6 lb (2.72 kg)	5.2	4.5
Large Heavy Pellets	2 lb (0.91 kg)	3.8	3.3
	4 lb (1.81 kg)	4.9	4.1
	6 lb (2.72 kg)	5.9	4.9

The chart below is for reference only. When spraying and spreading at the same time, set the spread pattern to twice the width of the spray; this will help avoid striping and streaking. For example, standard spray width = 2.7 m (9 ft) and spread width = 5.4 m (18 ft).

Grass Seed Application Coverage: 93 m² (1,000 ft²)				
Type	**Bag Weight**	**Dial Setting – Full Rate**	**Dial Setting – Half Rate**	**Spread Width**
Blue Grass or Red Top	0.23 kg (0.5 lb)	1.25		1.2 m (4 ft)
	0.45 kg (1 lb)	2.0		1.2 m (4 ft)
	0.9 kg (2 lb)	2.5		1.2 m (4 ft)
Park, Merion, Delta, or Kentucky Bluegrass	0.23 kg (0.5 lb)	2.5		1.2 m (4 ft)
	0.45 kg (1 lb)	3.0		1.2 m (4 ft)
	0.9 kg (2 lb)	3.5		1.2 m (4 ft)
Hulled Bermuda	0.9 kg (2 lb)	2.75	2.25	1.8 m (6 ft)
	1.36 kg (3 lb)	3.0	2.5	1.8 m (6 ft)
	1.81 kg (4 lb)	3.25	2.75	1.8 m (6 ft)
Mixtures Including Coarse Seeds	0.9 kg (2 lb)	6.0		1.8 m (6 ft)
	1.81 kg (4 lb)	7.0		1.8 m (6 ft)
	2.72 kg (6 lb)	7.0		1.8 m (6 ft)
Rye Grasses or Tall Fescue	0.9 kg (2 lb)	6.0		1.8 m (6 ft)
	1.81 kg (4 lb)	7.0		1.8 m (6 ft)
	2.72 kg (6 lb)	7.75		1.8 m (6 ft)
Dichondra	113 g (4 oz)	1.9		2.4 m (8 ft)
	226 g (8 oz)	2.1		2.4 m (8 ft)
	340 g (12 oz)	2.5		2.4 m (8 ft)
Pensacola Bahia	1.81 kg (4 lb)	4.5	3.75	2.1 m (7 ft)
	2.27 kg (5 lb)	4.75	4.0	2.1 m (7 ft)
	2.72 kg (6 lb)	5.0	4.25	2.1 m (7 ft)

Operating the Sprayer

The sprayer disperses liquid substances. Before using the sprayer make sure it has been properly cleaned before adding any chemicals. When using the sprayer, first fill the spray tank, then apply the solution to the work area, and finally clean the tank. It is important to complete all three of these steps to avoid damaging the sprayer. For example, do not mix and add chemicals in the spray tank at night and then spray in the morning. This would lead to separation of the chemicals and possible damage to the sprayer components.

Note: Clean your sprayer thoroughly after all applications.

Before Operating the Sprayer

Some chemicals are more aggressive than others and each chemical interacts differently with various materials. Some consistencies (e.g. wettable powders, charcoal) are more abrasive and lead to higher than normal wear rates. If a chemical is available in a formulation that would provide increased life to the sprayer, use this alternative formulation.

Make sure the sprayer has been calibrated before starting; refer to Spray Calibration/Tip Chart/Liquid Quantities (page 40).

Filling the Spray Tank

Important: **Ensure that the chemicals you will be using are compatible for use with Viton® or fluorocarbon (see the manufacturer's label; it should indicate if it is not compatible). Using a chemical that is not compatible with Viton® or fluorocarbon will degrade the O-rings in the sprayer, causing leaks.**

Important: **Verify that the proper application rate has been set prior to filling the tank with chemicals.**

Important: **The tank markings are for reference only and cannot be considered accurate for calibration.**

1. Stop the machine on a level surface, move motion control lever to the neutral position, stop the engine, and set the parking brake.
2. Determine the amount of water needed to mix the amount of chemical needed as prescribed by the chemical manufacturer.
3. Open the tank cap on the spray tank.
4. Add 3/4 of the required water to the spray tank.

   Important: **Always use fresh clean water in the spray tank. Do not pour concentrate into an empty tank.**
5. Start the engine and place the throttle midway between the SLOW and FAST positions.
6. Set the spray pump switch to the ON position.

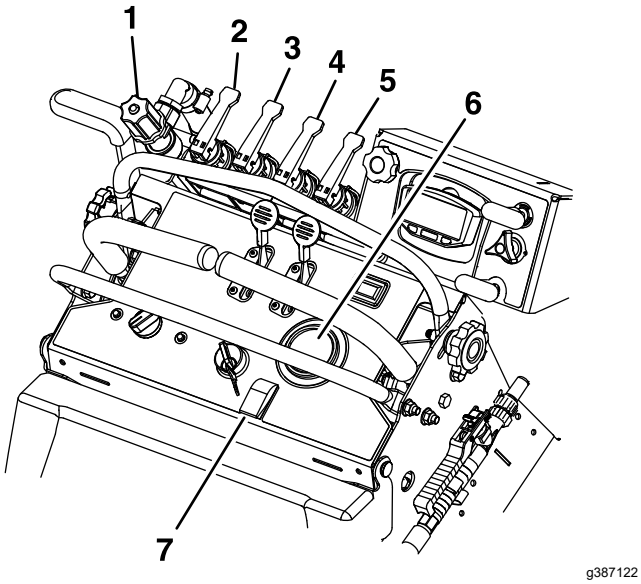


Figure 33

1. Spray pressure control knob
2. Left nozzle spray lever On/Off
3. Center nozzle spray lever On/Off
4. Right nozzle spray lever On/Off
5. Spray wand spray lever On/Off
6. Sprayer pressure gauge
7. Spray pump switch

7. Move the throttle to the FAST position.

   Note: The water in the tank will circulate.
8. Before adding chemicals to the tanks, be sure:
   - the valving is set for the tank that is being used; refer to Spray Pump Valving (page 14).
   - the spray pressure control knob is all the way open (turn counterclockwise). This will increase circulation/agitation and help purge the system of air.
9. Add the proper amount of chemical concentrate to the tank, as directed by the chemical manufacturer.

   Important: **If using a wettable powder, mix the powder with a small amount of water to form a slurry before adding it to the tank.**
10. Add the remaining water to the tank and secure tank cap.

    Note: Anytime the tank has been run dry, repeat steps 5 through 10. This will reduce the time required to purge the system of air.

Extending and Folding the Outer Spray Booms

The outer spray booms can be rotated forward to extend the boom or rearward to fold the boom.

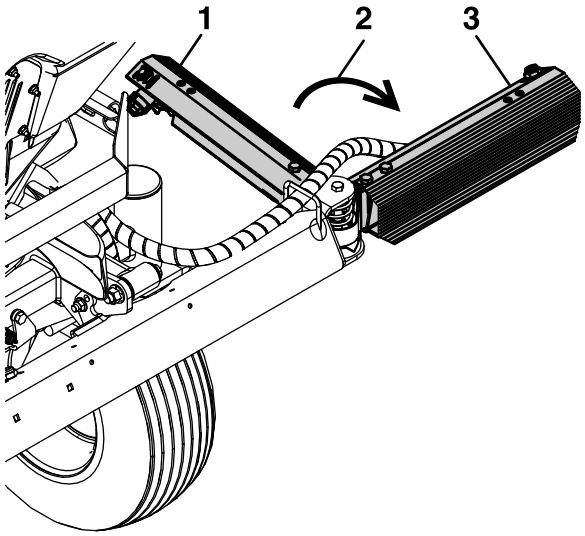


Figure 34

1. Outer spray boom–folded position
2. Rotate outward
3. Outer spray boom–extended position

Using the Sprayer Tank Shutoff Valves

Selecting the Left Spray Tank

Rotate the valve handles to the positions shown in Figure 35.

Important: **Always make sure at least one return valve is open when the spray pump is on.**

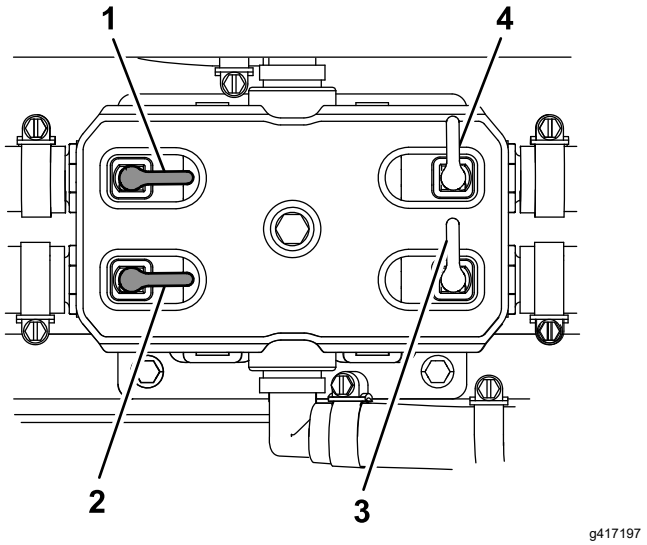


Figure 35

1. Left tank return valve (open position)
2. Left tank suction valve (open position)
3. Right tank suction valve (close position)
4. Right tank return valve (close position)

Selecting the Right Spray Tank

Rotate the valve handles as shown in Figure 36.

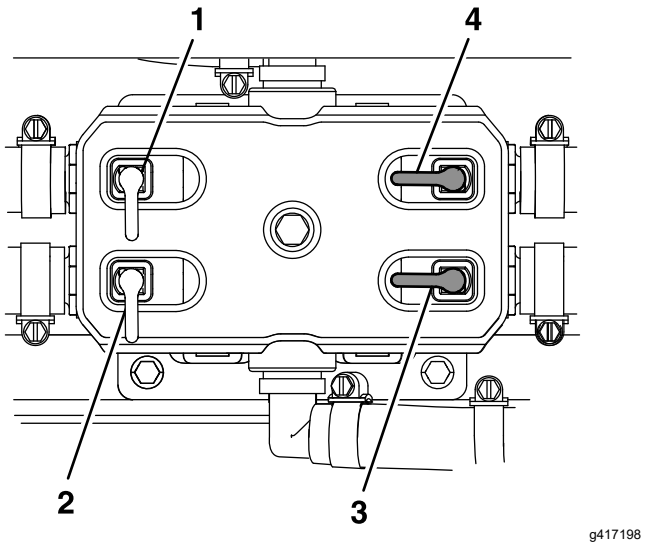


Figure 36

1. Left tank return valve (close position)
2. Left tank suction valve (close position)
3. Right tank suction valve (open position)
4. Right tank return valve (open position)

Selecting Both Spray Tanks

Rotate the valve handles as shown in Figure 37.

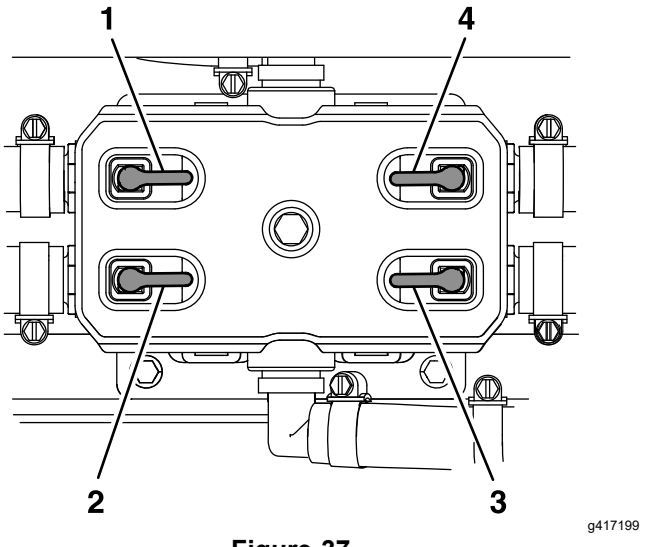


Figure 37

1. Left tank return valve (open position)
2. Left tank suction valve (open position)
3. Right tank suction valve (open position)
4. Right tank return valve (open position)

Spraying

Spraying Tips:

- Do not overlap the effective spray area that was previously sprayed.

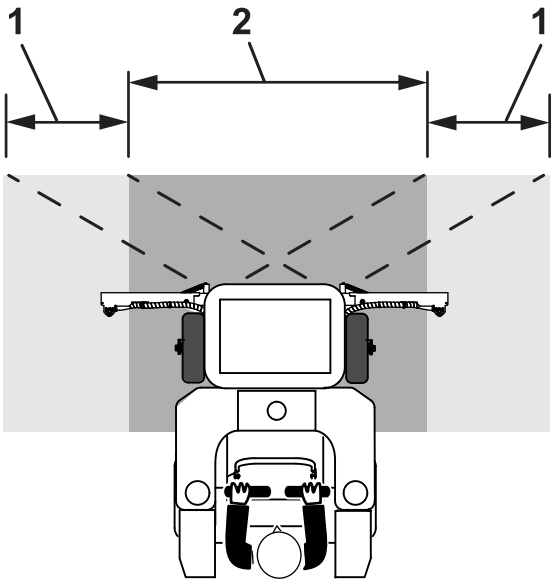


Figure 38

1. Overlap area
2. Effective spray area

- Watch for plugged nozzles.
- Disengage spray control levers to stop the spray flow before stopping the motion of the sprayer. Once stopped, leave the motion control lever in neutral and keep the pump running.

- Better results are obtained if the sprayer is moving when spray controls are turned on.
- Watch for changes in the application rate that may indicate that your speed has changed beyond the range of the nozzles or there is a problem with the spray system.

Note: Make sure the machine has been calibrated properly before starting spray application

1. Make sure the spray pump is on.
2. Drive to the work area to be sprayed.
3. Adjust the spray pressure to the appropriate setting.
4. Turn on the appropriate spray control:

   The sprayer and spreader can be operated either together or individually (spray liquid and spread granular at the same time or separately). Regardless of the situation, make sure that the machine is running at full throttle.

   When finished spraying, turn off the spray control lever and the spray pump switch.

   The spray pump switch can be left on for tank agitation.

   To use the spray wand:

⚠ WARNING

Spray wand traps liquids under high pressure, even when engine is off. High pressure spray discharge could cause serious injury or death.

- **Keep clear of nozzle and do not direct spray or stream at people, pets, or non-work area property.**
- **Do not direct spray on or near electrical power components or source.**
- **Do not repair spray wand, hoses, seals, nozzle, or other wand components; replace them.**
- **Do not attach hoses or other components to the end of the spray wand nozzle.**
- **Do not attempt to disconnect the spray wand from the unit while the system is pressurized.**
- **Do not use spray wand if trigger lock is damaged or missing.**
- **Do not keep spray wand in locked-open position when job is complete.**

   A. Remove the wand from the holder on the right side of the machine.

   B. Turn the spray wand flow valve on.

   C. Firmly grip and hold the spray wand. Point it in the direction to be sprayed.

      Note: Wand may kick back; make sure to hold the wand securely.

   D. Adjust the spray wand flow using the wand flow control.

   E. Squeeze the trigger to the spray wand handle to begin spraying; lock the trigger in place if desired.

5. When finished spraying:
   - From the front spray nozzles:

     Turn the three section valves off.
   - From the spray wand:

     A. Release the trigger and its lock (if applicable).

     B. Turn the spray wand flow valve off

     C. Return the wand back to its holder.

Important: **Contact an Authorized Service Dealer if the spreader-sprayer fails to operate properly.**

Cleaning the Sprayer

Clean the spray system after **each** spraying session.

Important: **Always empty and clean the sprayer immediately after each use. Failure to do so may cause the chemicals to dry or thicken in the lines, clogging the pump and other components.**

To properly clean the spray system:

- Use three separate rinses.
- Use a minimum of 19 L (5 US gallons) for each rinse.
- Use the cleaners and neutralizers as recommended by the chemical manufacturers.
- Use pure clean water (no cleaners or neutralizers) for the **last** rinse.

⚠ WARNING

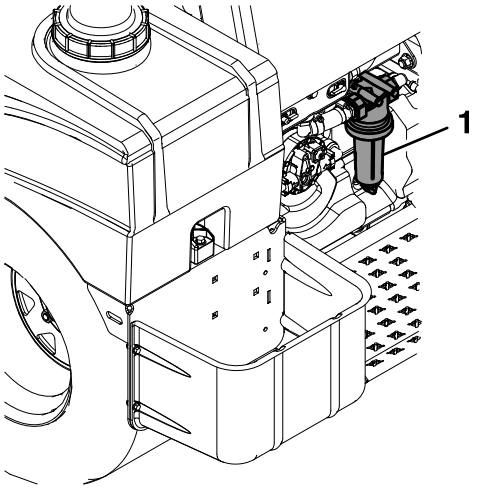
Do not clean spray nozzles by mouth or blowing through them. Swallowing or inhaling chemicals could cause serious injury or death.

Replace all worn and damaged nozzles.

Make sure nozzles are installed correctly.

1. Drive the machine to a designated cleaning area.
2. Stop the spreader-sprayer on a level surface, leave the motion control lever in the neutral position, and turn off the engine. Engage the parking brake.
3. Fill the tank with clean fresh water and close the cover.
4. Start the engine.
5. With the motion control lever in neutral position, engage the pump, and set the engine throttle to FAST.
6. Set the three spray valves to ON.
7. Allow the water in the tank to spray out through the nozzles.
8. Check the nozzles to ensure that they are all spraying correctly.
9. Set the spray valve to ON. Remove the wand from its holder and point it in a safe direction.
10. Squeeze the spray wand trigger to release the pressure.
11. Return the wand to its holder.
12. Set the spray control levers and the wand lever to the OFF position, disengage the pump, and stop the engine.
13. Clean the strainer located below the knee pad. Close both tank supply valves. When removing the canister, drain any unused chemical from the line and dispose of it according to local codes and the chemical manufacturer's instructions.

    Important: **If you used wetable powder chemicals, clean the strainer after each tank rinse.**



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Figure 39

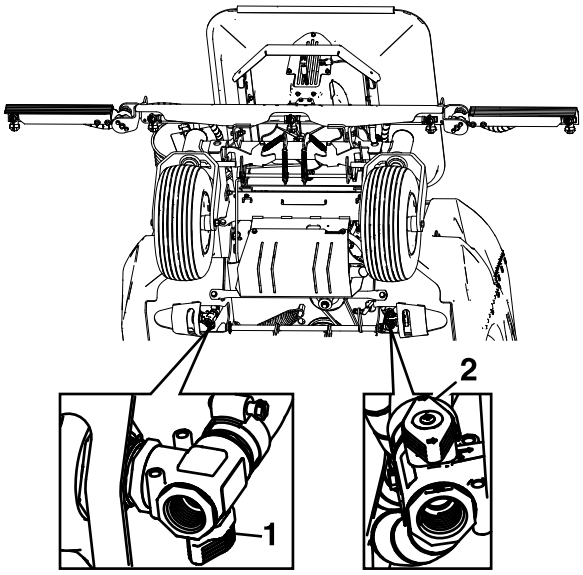
1. Strainer

14. Repeat steps 3 through 13.
15. Using a garden hose, spray off the outside of the sprayer tank with clean water.

    Note: Do Not use a power washer to clean the machine. The high pressure water may force residual corrosive materials into spreader-sprayer components.
16. Remove the nozzles and nozzle screen and clean them by hand. Replace damaged or worn nozzles.
17. Allow the spreader-sprayer to completely dry before the next use.

Spray Tank Drain Valves

The drain valves are located on the front inside of the tank.



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Figure 40

1. Right spray tank drain valve
2. Left spray tank drain valve

To open the tank drain valve, pull the handle outward and rotate clockwise.

To close the valve, pull the handle outward and rotate the handle counterclockwise until handle locks.

Spray Calibration/Tip Chart/Liquid Quantities

Note: Before using the sprayer for the first time, change nozzles, or as needed–calibrate the sprayer flow and speed.

Note: Refer to the chemical product label for application rate recommendations.

The lavender colored air injected tips come standard on the machine. These tips will apply liquid material at 1.24 L (0.34 US gallons) per 93 m^2 (1,000 ft^2) at 8 km/h (5 mph) and 276 kPa (40 psi). Each tip has a 276 kPa (40 psi) shut-off screen to prevent drip.

The machine is capable of using tips from 0.95 L (0.25 US gallons) to 3.8 L (1 US gallons) in size. See the chart below for the desired drop rate.

Note: This chart only applies if using air injected tips. Using other tips will require different calculations.

Tip Color	KM/H	MPH	kPa	psi	L/96 m^2	US gallons/ 1,000 ft^2
Yellow	8	5	276	40	0.95 L	0.25 (1/4) US gallon
Lavender	8	5	276	40	1.25 L	0.33 (1/3) US gallon
Red	8	5	276	40	1.9 L	0.5 (1/2) US gallon
Brown	8	5	345	50	2.84 L	0.75 (3/4) US gallon
Grey	6	4	276	40	3.79 L	1 US gallon

Note: Please refer to the spray chart, located on the backside of the knee pad, for complete calibration.

To determine liquid quantities per tank, verify the tips installed on the machine (factory set is 1.25 L (0.33 US gallon) per 96 m^2 (1,000 m^2 through the Lavender tips).

For example, if the product calls for 32.5 to 44.3 ml (1.1 to 1.5 oz) per 96 m^2 1,000 m^2, use the median value of 38.4 ml (1.3 oz). The lavender tip is a 1.25 L (1/3 US gallon) tip, multiply by 3, and then multiply that number by the gallons added to the tank. If the tank is 113.5 L (30 US gallons) the equation would look like this:

1.3 X 3 X gallons needed.

1.3 median value X 3 X 30 gallons = 117 ounces used in 30 gallons of water.

After Operation

After Operation Safety

General Safety

- Park machine on level ground, disengage drives, set parking brake, stop engine, and remove key. Wait for all moving parts to stop before leaving the operator's position. Allow the machine to cool before servicing, adjusting, fueling, cleaning, or storing.
- Clean grass, leaves, excessive grease or oil, and other debris from the muffler, drives, and engine area to help prevent fires.

Transporting the Machine

Note: Refer to the chemical warning product label(s) before transporting the machine and follow all local/state/federal requirements for transporting chemicals.

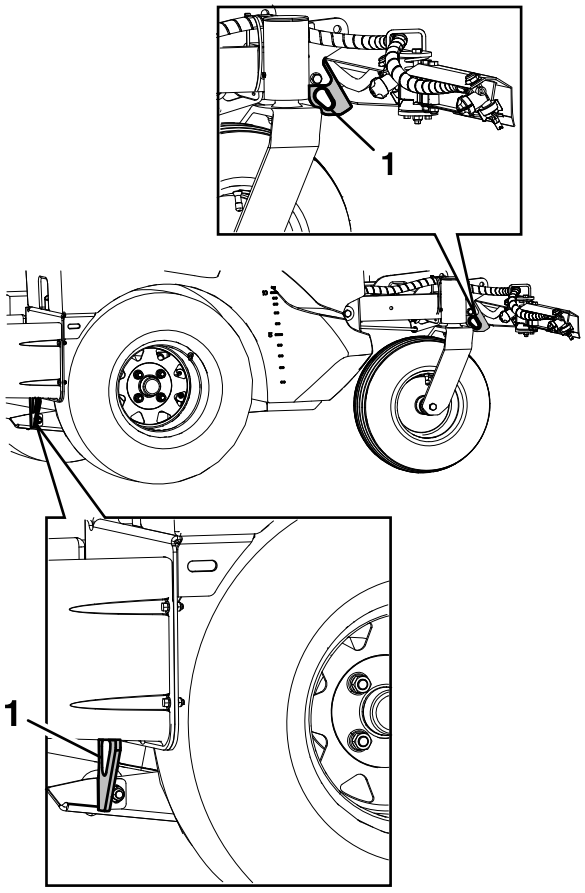
Note: Make sure the spreader hopper cover and the spray wand are secure before transporting.

Transporting the Machine

Use a heavy-duty trailer or truck to transport the machine. Ensure that the trailer or truck has all necessary lighting and marking as required by law. Thoroughly read all of the safety instructions. Knowing this information could help you, your family, pets, or bystanders avoid injury.

To transport the machine:

- Lock the brake and block the wheels.
- Securely fasten the machine to the trailer or truck with straps, chains, cable, or ropes. When securing the front of the machine, only use the tie down locations shown in Figure 41. If possible, both front and rear straps should be directed down and outward from the machine. Using non-designated locations may cause damage to the machine and/or attachment.



g387256

Figure 41

1. Tie down location

⚠ WARNING

Securing the machine on any upper frame location will cause the parking brake to not function properly, which could cause serious injury or death.

Only use the front tie down locations on the lower frame to secure the machine.

- Secure a trailer to the towing vehicle with safety chains.

⚠ WARNING

Driving on the street or roadway without turn signals, lights, reflective markings, or a slow moving vehicle emblem is dangerous and can lead to accidents causing personal injury.

Do not drive machine on a public street or roadway.

Loading the Machine

Use extreme caution when loading machines on trailers or trucks. One full width ramp that is

wide enough to extend beyond the rear tires is recommended instead of individual ramps for each side of the machine. A full width ramp provides a surface to walk on behind the machine. If it is not possible to use one full width ramp, use enough individual ramps to simulate a full width continuous ramp.

A steep ramp angle may cause components to get caught as the machine moves from ramp to trailer or truck. Steeper angles may also cause the machine to tip backward. If loading on or near a slope, position the trailer or truck so it is on the down side of the slope and the ramps extends up the slope. This will minimize the ramp angle. The trailer or truck should be as level as possible.

Important: **Do not attempt to turn the machine while on the ramp, you may lose control and drive off the side.**

Avoid sudden acceleration when driving up a ramp and sudden deceleration when backing down a ramp. Both maneuvers can cause the machine to tip backward.

⚠ WARNING

Loading a machine on a trailer or truck increases the possibility of backward tip-over. Backward tip-over could cause serious injury or death.

- **Use extreme caution when operating a machine on a ramp.**
- **Use only a single, full width ramp; do not use individual ramps for each side of the machine.**
- **If individual ramps must be used, use enough ramps to create an unbroken ramp surface wider than the machine.**
- **Avoid sudden acceleration while driving machine up a ramp to avoid tipping backward.**
- **Avoid sudden deceleration while backing machine down a ramp to avoid tipping backward.**

Maintenance

Note: Determine the left and right sides of the machine from the normal operating position.

Maintenance Safety

- Park machine on level ground. Disengage the spray or close the spreader gate, set the parking brake, stop engine and remove key or disconnect spark plug wire. Wait for all moving parts to stop before leaving the operator's position. Allow the machine to cool before servicing, adjusting, fueling, unclogging, cleaning, or storing.
- If you leave the key in the switch, someone could accidently start the engine and seriously injure you or other bystanders. Remove the key from the switch before you perform any maintenance.
- Never allow untrained personnel to service machine.
- Disconnect battery or remove spark plug wire before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- Relieve the spray pressure from the system before servicing.
- Empty the tank and/or hopper before tilting the machine for maintenance and before storing.
- Keep all guards, shields, switches, and all safety devices in place and in proper working condition. Frequently check for worn or deteriorating components and replace them with genuine Toro parts when necessary.

⚠ WARNING

Removal or modification of original equipment, parts and/or accessories may alter the warranty, controllability, and safety of the machine. Unauthorized modifications to the original equipment or failure to use original Toro parts could lead to serious injury or death. Unauthorized changes to the machine, engine, fuel or venting system, may violate applicable safety standards such as: ANSI, OSHA and NFPA and/or government regulations such as EPA and CARB.

⚠ WARNING

Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid accidentally injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.

- **If equipped, make sure all hydraulic fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to hydraulic system.**
- **Keep body and hands away from pinhole leaks or nozzles that eject high pressure hydraulic fluid.**
- **Use cardboard or paper, not your hands, to find hydraulic leaks.**
- **Safely relieve all pressure in the hydraulic system by placing the motion control levers in neutral and shutting off the engine before performing any work on the hydraulic system.**

- Do not rely solely on mechanical or hydraulic jacks for support. Use adequate jack stands.
- Carefully release pressure from components with stored energy.
- Keep your hands and feet away from moving parts or hot surfaces. If possible, do not make adjustments with the engine running.
- Keep all parts in good working condition and all hardware tightened.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 5 hours	• Change the engine oil.
After the first 100 hours	• Check the wheel mount screw torque specification. • Change hydraulic system filter and fluid.
Before each use or daily	• Check air cleaner; replace if dirty. (May need more often under severe conditions.) • Check the engine oil level. • Check fuel strainer, filter, and tank. • Check for loose hardware. • Clean the engine and exhaust system area. • Clean the debris build-up from the machine.
Every 40 hours	• Check the condition of belt. • Check the hydraulic oil and tank level.
Every 50 hours	• Check the tire pressures. • Check spreader system. • Check sprayer system.
Every 80 hours	• Remove engine shrouds and clean cooling fins.
Every 100 hours	• Grease caster pivots (2x). • Grease idler pivot. • Replace the dual element air cleaner element. • Change the engine oil. (May need more often under severe conditions.)
Every 400 hours or yearly, whichever comes first	• Check the wheel mount screw torque specification. • Change hydraulic system filter and fluid (Every 250 hours/Yearly if using Mobil 1 15W50).
Monthly	• Check the battery charge.

Notation for Areas of Concern

Inspection performed by:		
Item	**Date**	**Information**
1		
2		
3		
4		
5		
6		
7		
8		

Important: **Refer to your engine owner's manual for additional maintenance procedures.**

Lubrication

Lubricate Grease Fittings

Service Interval: Every 100 hours/Yearly (whichever comes first)

Every 100 hours/Yearly (whichever comes first)

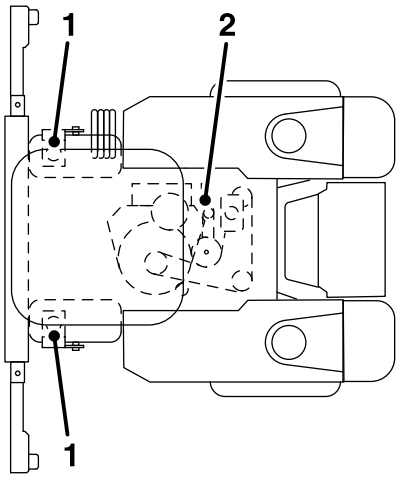
Note: See chart for service intervals.

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Lubricate fittings with NLGI grade #2 multi-purpose gun grease.

   Refer to the maintenance chart for fitting locations and lubrication schedule.

Lubrication Chart

Fitting Locations	Initial Pumps	Number of Places	Service Interval
1. Front Caster Pivots	*0	2	Yearly
2. Idler Pivot	1	1	Yearly



*See step 3 for special lubrication instructions on the caster pivots.

3. Lubricate caster pivots once a year. Remove hex plug and cap. Thread grease zerk in hole and pump with grease until it oozes out around top bearing. Remove grease zerk and thread plug back in. Place cap back on.

Engine Maintenance

Service Air Cleaner

Service Interval: Before each use or daily—Check air cleaner; replace if dirty. (May need more often under severe conditions.)

Every 100 hours/Yearly (whichever comes first)—Replace the dual element air cleaner element.

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. See the engine owner's manual for maintenance instructions.

Check Engine Oil Level

Service Interval: Before each use or daily

1. Stop engine and wait for all moving parts to stop. Make sure unit is on a level surface.
2. Check with engine cold.
3. Clean area around dipstick. Remove dipstick and wipe oil off. Reinsert the dipstick according to the engine manufacturer's recommendations. Remove the dipstick and read the oil level.
4. If the oil level is low, wipe off the area around the oil fill cap, remove cap and fill to the FULL mark on the dipstick. Refer to the engine owner's manual for an appropriate API rating and viscosity. **Do not** overfill.

Important: **Do not operate the engine with the oil level below the LOW (or ADD) mark on the dipstick, or over the FULL mark.**

Change Engine Oil

Service Interval: After the first 5 hours

Every 100 hours/Yearly (whichever comes first) (May need more often under severe conditions.)

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Flip the hopper forward.
3. Drain oil while engine is warm from operation.
4. Remove dip stick. The oil drain plug is located on the left side of the engine.

   Place pan under machine to catch oil. Remove drain oil plug to open and allow oil to drain and reinstall plug when complete.
5. Replace the oil filter every other oil change. Clean around oil filter and unscrew filter to remove. Before reinstalling new filter, apply a

thin coating of engine oil on the surface of the rubber seal. Turn filter clockwise until rubber seal contacts the filter adapter then tighten filter an additional 1/2 to 3/4 turn.

6. Clean around oil fill cap and remove cap. Fill to specified capacity and replace cap.
7. Use oil recommended in the Check Engine Oil Level (page 46) section. **Do not** overfill. Start the engine and check for leaks. Stop engine and recheck oil level.
8. Wipe up any spilled oil from engine deck mounting surfaces.
9. Lower and latch the hopper into operating position.

Fuel System Maintenance

Check Fuel Filter and Tank

Service Interval: Before each use or daily

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Check the fuel filter and tank for leaks. See engine owner's manual.

Electrical System Maintenance

Check Battery Charge

Service Interval: Monthly

Allowing batteries to stand for an extended period of time without recharging them will result in reduced performance and service life. To preserve optimum battery performance and life, recharge batteries in storage when the open circuit voltage drops to 12.4 V.

Note: To prevent damage due to freezing, battery should be fully charged before putting away for winter storage.

Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.

⚠ DANGER

Charging or jump starting the battery may produce explosive gases. Battery gases can explode causing serious injury.

- **Keep sparks, flames, or cigarettes away from battery.**
- **Ventilate when charging or using battery in an enclosed space.**
- **Make sure venting path of battery is always open once battery is filled with acid.**
- **Always shield eyes and face from battery.**

⚠ DANGER

Battery electrolyte contains sulfuric acid, which is poisonous and can cause severe burns. Swallowing electrolyte can be fatal or if it touches skin can cause severe burns.

- **Wear safety glasses to shield eyes, and rubber gloves to protect skin and clothing when handling electrolyte.**
- **Do not swallow electrolyte.**
- **In the event of an accident, flush with water and call a doctor immediately.**

⚠ CAUTION

If the ignition is in the ON position there is potential for sparks and engagement of components. Sparks could cause an explosion or moving parts could accidentally engage causing personal injury.

Be sure ignition switch is in the OFF position before charging the battery.

1. Check the voltage of the battery with a digital voltmeter or with the message display. If the voltage is less than 12.4 V, the battery may need to be charged.

   Important: **In order to prevent damage to the battery, use an automatic 12 volt smart charger approved for use with AGM type batteries with an output of 3.5 amps or less. Toro recommends the use of battery charger P/N 135-7024. Make sure the negative battery cable is disconnected before charging and that the charger is set to the correct mode for 12 V AGM batteries.**

2. Connect the negative battery cable.

   Note: If the positive cable is also disconnected, connect the **positive (red) cable** to the positive battery terminal **first**, then the negative (black) cable to the negative battery terminal. Slip insulator boot over the positive terminal.

   Note: If time does not permit charging the battery, or if charging equipment is not available, connect the negative battery cables and run the vehicle continuously for 20 to 30 minutes to sufficiently charge the battery.

Recommended Jump Starting Procedure

1. Check the weak battery for terminal corrosion (white, green, or blue “snow”), it must be cleaned off prior to jump starting. Clean and tighten connections as necessary.

   ⚠ CAUTION

   Corrosion or loose connections can cause unwanted electrical voltage spikes at anytime during the jump starting procedure.

   Do not attempt to jump start with loose or corroded battery terminals or damage to the engine may occur.

⚠ DANGER

Jump starting a weak battery that is cracked, frozen, has low electrolyte level, or an open/shorted battery cell, can cause an explosion resulting in serious personal injury.

Do not jump start a weak battery if these conditions exist.

2. Make sure the booster is a good and fully charged lead acid battery at 12.6 V or greater. Use properly sized jumper cables (4 to 6 AWG) with short lengths to reduce voltage drop between systems. Make sure the cables are color coded or labeled for the correct polarity.

⚠ CAUTION

Connecting the jumper cables incorrectly (wrong polarity) can immediately damage the electrical system.

Be certain of battery terminal polarity and jumper cable polarity when hooking up batteries.

Note: The following instructions are adapted from the SAE J1494 Rev. Dec. 2001 – Battery Booster Cables – Surface Vehicle Recommended Practice (SAE – Society of Automotive Engineers).

⚠ WARNING

Batteries contain acid and produce explosive gases.

- **Shield the eyes and face from the batteries at all times.**
- **Do not lean over the batteries.**

Note: Be sure the vent caps are tight and level. Place a damp cloth, if available, over any vent caps on both batteries. Be sure the vehicles do not touch and that both electrical systems are off and at the same rated system voltage. These instructions are for negative ground systems only.

3. Connect the positive (+) cable to the positive (+) terminal of the discharged battery that is wired to the starter or solenoid as shown in Figure 42.

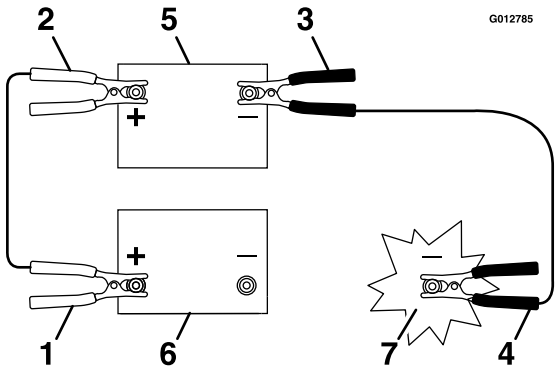


Figure 42

1. Positive (+) cable on discharged battery
2. Positive (+) cable on booster battery
3. Negative (–) cable on the booster battery
4. Negative (–) cable on the engine block
5. Booster battery
6. Discharged battery
7. Engine block

4. Connect the other end of the positive cable to the positive terminal of the booster battery.
5. Connect the black negative (–) cable to the other terminal (negative) of the booster battery.
6. Make the final connection on the engine block of the stalled vehicle (not to the negative post) away from the battery. Stand back.
7. Start the vehicle and remove the cables in the reverse order of connection (the engine block (black) connection is the first to disconnect).

Drive System Maintenance

Check Tire Pressures

Service Interval: Every 50 hours

1. Stop engine, wait for all moving parts to stop, and remove key. Engage the parking brake.
2. Check the tire pressure in the drive tires.
3. Inflate all tires to 13 psi (90 kPa).

Wheel Mount Screw Torque Specification

Service Interval: After the first 100 hours

Every 400 hours or yearly, whichever comes first/Yearly (whichever comes first) thereafter

Torque the lug nuts on the wheel hub to 129 N•m (95 ft-lb).

Belt Maintenance

Check Condition of Belt

Service Interval: Every 40 hours

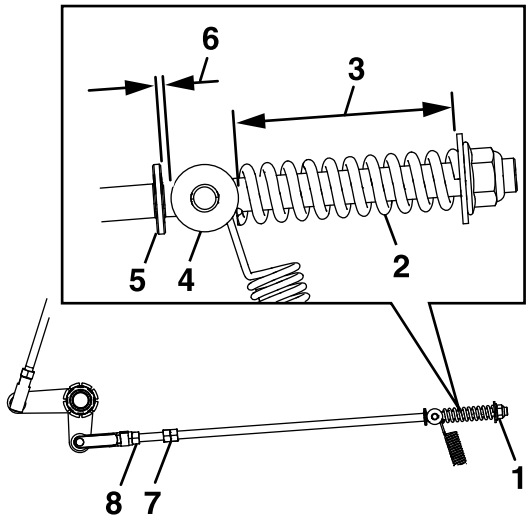
1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Check the belt condition and tension.

Controls System Maintenance

Adjusting the Parking Brake

If the parking brake does not hold securely, an adjustment is required.

1. Park the machine on a level surface and engage the brake.
2. Shut off engine and wait for all moving parts to stop. Remove and retain the rear cover panel in front of the Operator's platform.
3. With the park brake engaged, the compression spring on both sides should measure 51 mm (2 inches). The gap between the trunnion and the shoulder should measure 3-6 mm (0.12-0.24 inch) on the lower brake linkages.



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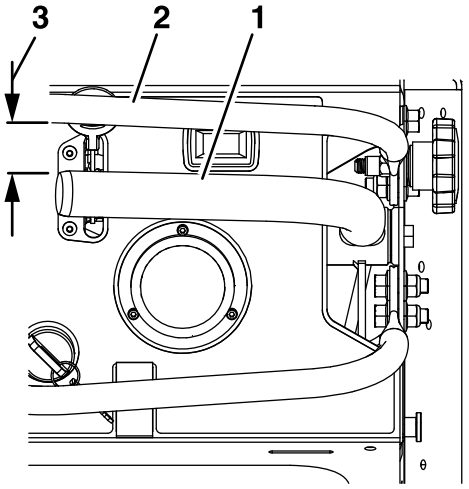
Figure 43

1. Nut to adjust compression spring
2. Compression spring
3. 51 mm (2 inches)
4. Trunnion
5. Shoulder
6. 3-6 mm (0.12-0.24 inch)
7. Two jam nuts
8. Clevis yoke jam nut

4. To adjust the spring length, turn the nut clockwise to shorten the spring. Cycle the park brake lever off and on and re-measure the spring length and check the gap.
5. To adjust the gap, loosen the jam nuts on the lower brake linkage against the clevis yokes. Using the two jam nuts, tighten together and rotate the linkage in the appropriate direction to either increase or decrease the gap. Cycle the park brake lever off and on and re-measure gap and spring length.
6. Engage the park brake and check. If more adjustment are needed, repeat steps 5 and 6.
7. Retighten the jam nuts.
8. Install the left rear hydro cover.

Motion Control Linkage Adjustment

1. Park the machine on a level surface.
2. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
3. Loosen the two knobs that secure the front reference/speed control bar and push it all the way forward. Slightly tighten the knobs.
4. With the motion control levers in the neutral position, the gap between the front reference/speed control bar should measure 95 mm (3.75 inches).



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Figure 44

1. Right hand motion control lever
2. Front reference/speed control bar
3. 95 mm (3.75 inches)

5. If an adjustment is needed, remove the knee pad.
6. Loosen the upper jam nut at the base of the ball joint as shown in Figure 45. Adjust the control rod length by turning the two jam nuts. To increase the gap, turn the control rod counterclockwise. To decrease the gap, turn the control rod clockwise.

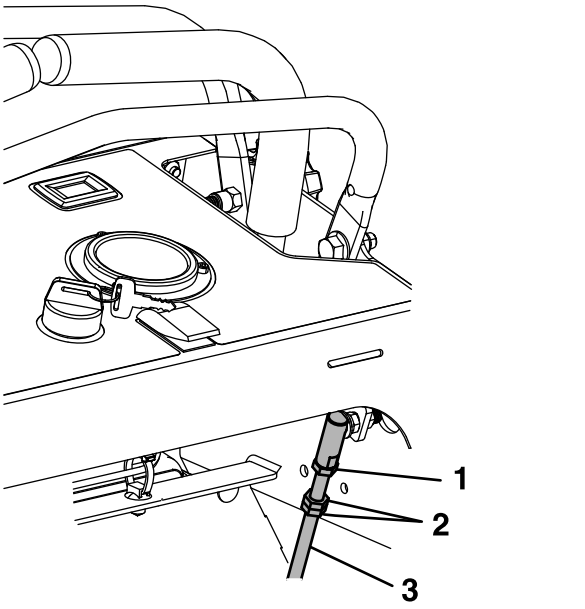


Figure 45
Right Motion Control Linkage Shown

1. Upper jam nut
2. Jam nuts
3. Control rod

7. Retighten the jam nuts on the control rod.
8. Replace the knee pad.

Motion Control Tracking Adjustment

If the machine travels or pulls to one side when the motion control levers are in the full forward position, adjust the tracking.

1. Park the machine on a level surface.
2. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
3. Make sure there is a 95 mm (3.75 inches) gap between the motion control levers and the front reference/speed control bar. Refer to Motion Control Linkage Adjustment (page 51).
4. Remove the knee pad.
5. Loosen the top jam nut at the upper end of the ball joint on the lever that needs to be adjusted (Figure 45).
6. To increase the speed, turn the control rod counterclockwise in quarter turn increments. To decrease the speed, turn the control linkage clockwise in quarter turn increments.
7. Retighten the jam nuts on the control rod.
8. Drive the machine and check the full forward tracking.
9. Replace the knee pad.
10. Repeat steps 5 through 8 until desired tracking is obtained.

Hydraulic System Maintenance

Check Hydraulic Oil and Tank Level

Service Interval: Every 40 hours

1. Stop engine and wait for all moving parts to stop, and remove key. Engage parking brake.
2. Wait until the machine cools before checking the hydraulic oil.
3. With the hopper empty, tip the hopper forward.
4. Clean area around oil overflow tank and remove cap. Oil level should be at the FULL COLD line; if not, add hydraulic oil. Replace tank cap and tighten until snug. Do not overtighten.

Change Hydraulic System Filter and Fluid

Service Interval: After the first 100 hours

Every 400 hours or yearly, whichever comes first thereafter
(Every 250 hours/Yearly if using Mobil 1 15W-50 thereafter)

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Carefully clean area around the filter. It is important that no dirt or contamination enter hydraulic system.
3. Place a catch pan under each hydro filter.
4. Remove and retain the oil filter covers on each of the transaxles. Remove and discard the O-ring from the covers.
5. Allow the oil to drain. Remove and discard the filters from the transaxle housings.

   Install a new O-ring onto the filter cover and reinstall the cover. Torque to 51-65 N•m (450-580 in-lb).
6. Remove the top oil fill vent port plug and fill until it reaches the oil fill vent port. Reinstall the vent port plug and continue to fill as stated in Check Hydraulic Oil and Tank Level (page 53).

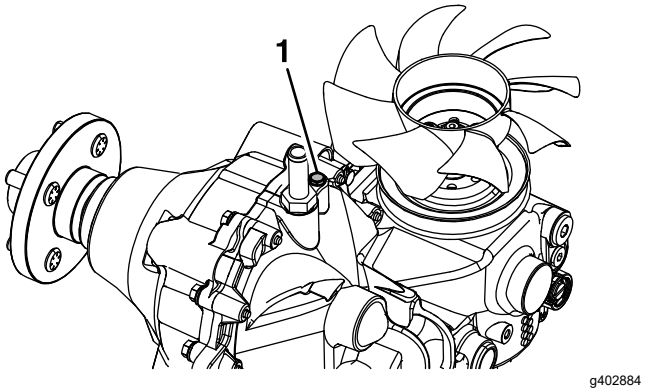


Figure 46

1. Oil fill vent port plug

Hydro Oil	Service Interval
Toro Hypr-Oil 500	After first 100 hours *Every 400 hours thereafter
Mobil 1 15W-50	After first 100 hours *Every 250 hours thereafter

*May need more often under severe conditions.

7. Remove the catch pan and properly dispose of hydro oil and filter according to local codes.

Note: Do not change hydraulic system oil (except for what can be drained when changing filter), unless it is felt the oil has been contaminated or been extremely hot.
Changing oil unnecessarily could damage hydraulic system by introducing contaminates into the system.

Hydraulic System Air Purge

Air must be purged from the hydraulic system when any hydraulic components, including oil filter are removed.

1. Stop engine and wait for all moving parts to stop. Raise the rear of the machine up onto jack stands high enough to raise the drive wheels off the ground.
2. Check oil level as described in Check Hydraulic Oil and Tank Level (page 53).
3. Start engine and move throttle control ahead to full throttle position. Move the speed control lever to the middle speed position and place the drive levers in the DRIVE position.
4. Open the drive wheel release on each pump.
5. With the machine running, slowly stroke the drive levers from forward to reverse several times. Then, retighten the drive wheel release valves. Slowly stroke the drive levers from forward to reverse several times.
6. If either drive wheel still does not rotate, stop and repeat steps 4 and 5 above for the respective

pump. If wheels rotate slowly, the system may prime after additional running. Check oil level as described in Check Hydraulic Oil and Tank Level (page 53).

7. Allow the machine to run several minutes after the charge pumps are “primed” with drive system in the full speed position. Check oil level as described in Check Hydraulic Oil and Tank Level (page 53).
8. Check hydro drive linkage adjustment.

Maintaining the Chassis

Check for Loose Hardware

Service Interval: Before each use or daily

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Visually inspect machine for any loose hardware or any other possible problem. Tighten hardware or correct the problem before operating.

Maintaining the Sprayer and Spreader Systems

Check Spreader System

Service Interval: Every 50 hours

Clean the bottom of the hopper with a wire brush and clean off any fertilizer if needed.

Change out the hopper bottom bushing or the impeller if needed.

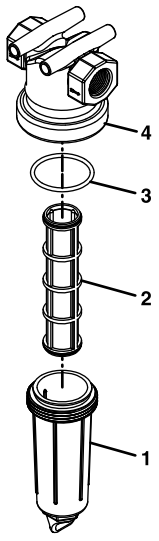
Check Sprayer System

Service Interval: Every 50 hours

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Check all hoses, nozzles, and fittings for leaks.
3. Check nozzle strainers and in-line strainers.
4. Replace as needed.

Check In-line Filter

Periodically check the in-line filter for any debris in the screen. If debris is present, this can create erratic pressure spikes and/or not allow the proper flow through system. After clearing any debris, ensure that gasket remains intact and tighten in-line filter cap (if not installed properly, this will allow air to get in the system and system will lose or not create pressure).



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Figure 47

1. Cap
2. Filter
3. O-ring (attached to cap)
4. In-line filter housing

Cleaning

Cleaning and Storing Safety

- Park machine on level ground, disengage drives, set parking brake, stop engine, and remove key. Wait for all moving parts to stop before leaving the operator's position. Allow the machine to cool before servicing, adjusting, fueling, unclogging, cleaning, or storing.
- Clean grass and debris from the muffler, drives, and engine compartment to prevent fires.
- Allow the machine to cool before storing the machine in any enclosure. Do not store the machine or fuel container, or refuel, where there is an open flame, spark, or pilot light such as on a water heater or other appliance.

Clean Engine and Exhaust System Area

Service Interval: Before each use or daily (May be required more often in dry or dirty conditions.)

⚠ CAUTION

Excessive debris around engine cooling air intake and exhaust system area can cause engine, exhaust area, and hydraulic system to overheat which can create a fire hazard.

Clean all debris from engine and exhaust system area.

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Clean all debris from rotating engine air intake screen, around engine shrouding, and exhaust system area.
3. Wipe up any excessive grease or oil around the engine and exhaust system area.
4. Clean muffler heat shields of all debris, dirt, and oil.

Remove Engine Shrouds and Clean Cooling Fins

Service Interval: Every 80 hours

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.

2. Remove cooling shrouds from engine and clean cooling fins. Also clean dust, dirt, and oil from external surfaces of engine which can cause improper cooling.
3. Make sure cooling shrouds are properly reinstalled. Operating the engine without cooling shrouds will cause engine damage due to overheating.

Clean Debris From Machine

Service Interval: Before each use or daily

1. Stop engine, wait for all moving parts to stop, and remove key. Engage parking brake.
2. Clean off any oil, debris, or build-up on the machine, especially the nozzles, tank opening, impeller, spray wand and its holder, around engine and exhaust area.

Important: **You can wash the machine with mild detergent and water. Do not pressure wash the machine. Avoid excessive use of water, especially near the control panel, under the cushion, around the engine, hydraulic pumps, motors, and drive axle seals.**

Waste Disposal

Chemical Disposal

Improper chemical disposal can pollute the environment and cause health issues.

Follow the disposal directions on the chemical manufacturer's label. Dispose of chemicals and containers in accordance to local/state/federal laws.

Motor Oil Disposal

Engine oil and hydraulic oil are both pollutants to the environment. Dispose of used oil at a certified recycling center or according to your state and local regulations.

Battery Disposal

⚠ DANGER

Battery electrolyte contains sulfuric acid, which is poisonous and can cause severe burns. Swallowing electrolyte can be fatal or if it touches skin can cause severe burns.

- **Wear safety glasses to shield eyes, and rubber gloves to protect skin and clothing when handling electrolyte.**
- **Do not swallow electrolyte.**
- **In the event of an accident, flush with water and call a doctor immediately.**

Federal law states that batteries should not be placed in the garbage. Management and disposal practices must be within relevant federal, state, or local laws.

If a battery is being replaced or if the unit containing the battery is no longer operating and is being scrapped, take the battery to a local certified recycling center. If no local recycling is available return the battery to any certified battery reseller.

Storage

Extended or Winter Storage

To help protect the pumps from freezing temperatures make sure the unit is free of all caustic chemicals and residue.

Spreader Cleaning

Perform all the steps in Cleaning the Spreader (page 26) in the Operation section.

Sprayer Cleaning

1. Perform all the steps in Cleaning the Sprayer (page 38) in the Operation section.
2. Add a rust inhibiting, non-alcohol based, RV antifreeze solution to the system. See label to ensure the product will provide appropriate protection for the climate.
   A. Make sure the sprayer is empty and let the pump run until the nozzles are spraying air.
   B. Pour 7.6 L (2 US gallons) of RV anti-freeze into each of the sprayer tanks.
   C. Run the pump to distribute the anti-freeze mix throughout the system.
   D. Set the spray levers position to begin spraying. Allow the antifreeze to circulate through sprayer and nozzles. Remove the wand from its holder, point it in a safe direction, and squeeze the spray wand trigger. Return the wand to its holder.

      Note: Do not allow all the mix to spray out of the tank. Keeping some antifreeze in the pump, valves, and hoses will help prevent rusting and damage caused by moist air that may be trapped in the system.
   E. Turn off the spray control lever and the spray pump switch.

General Cleaning

Follow all instructions in the Maintenance (page 43) and Cleaning and Storing Safety (page 55) sections.

Refer to the engine owner’s manual for proper storage of the engine.

Battery Storage

Disconnect the battery and place on a trickle charger for a few hours once per month.

Troubleshooting

Important: **It is essential that all operator safety mechanisms be connected and in proper operating condition prior to use.**

Important: **When troubleshooting or replacing electrical components, disconnect the capacitor harness from the main harness before performing any maintenance.**

When a problem occurs, do not overlook the simple causes. For example: starting problems could be caused by an empty fuel tank.

The following table lists some of the common causes of trouble. Do Not attempt to service or replace major items or any items that call for special timing of adjustments procedures (such as valves, governor, etc.). Have this work done by your engine service dealer.

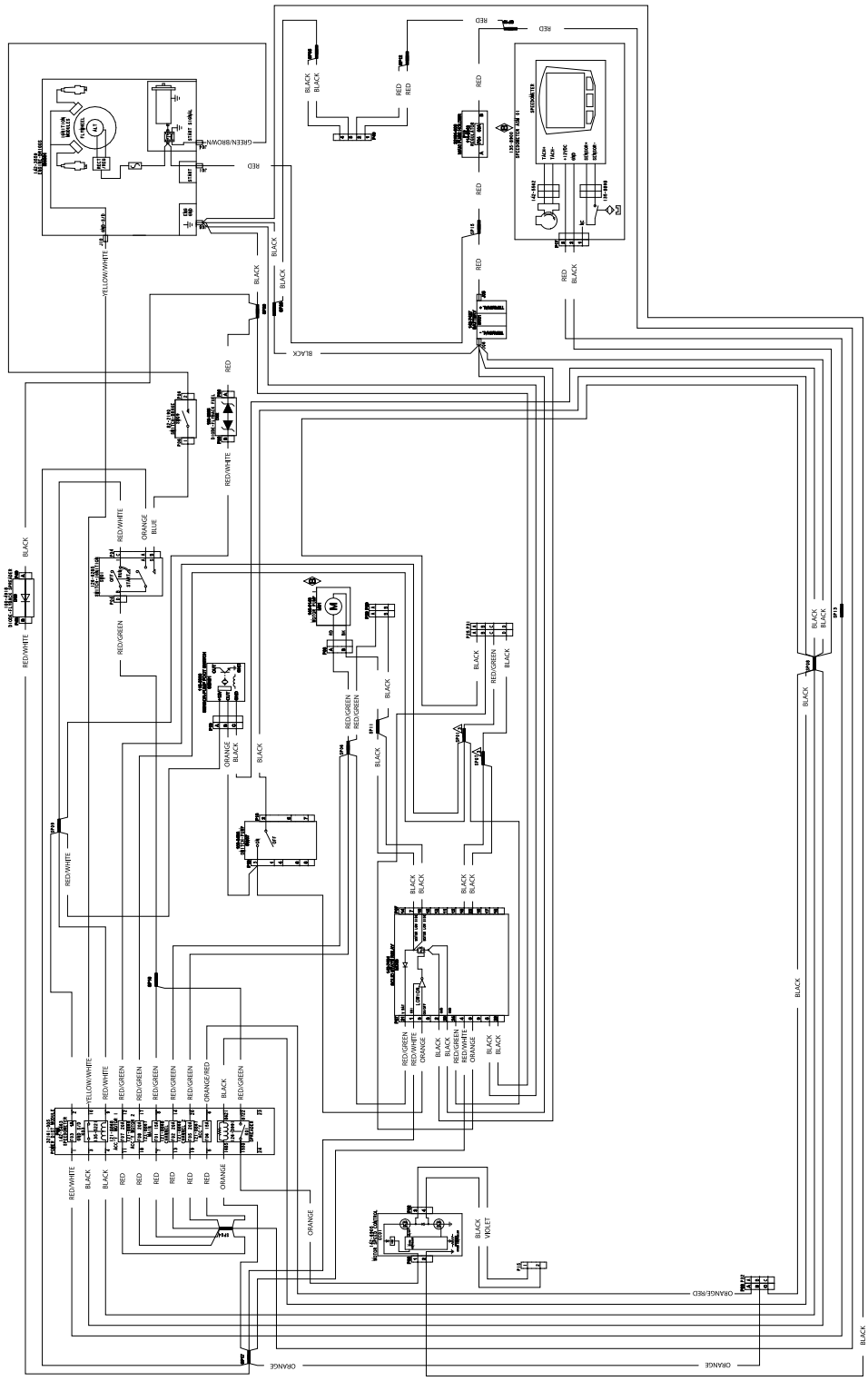
Note: When disconnecting electrical connectors, do not pull on the wires to separate the connectors.

Problem	Possible Cause	Corrective Action
Starter does not crank.	1. Battery does not have a full charge.	1. Charge the battery. See **Check Battery Charge** and **Recommended Jump Starting Procedure** sections in Maintenance.
	2. Electrical connections are corroded, loose or faulty.	2. Check the electrical connections for good contact. Clean connector terminals thoroughly with electrical contact cleaner, apply dielectric grease and reconnect.
	3. Fuse is blown.	3. Replace the blown fuse.
	4. Relay or switch is defective.	4. Contact an Authorized Service Dealer.
Engine will not start, starts hard, or fails to keep running	1. Fuel tank is empty.	1. Fill the fuel tank.
	2. The throttle and choke are not in the correct position.	2. Be sure the throttle control is midway between the “SLOW” and “FAST” positions, and the choke is in the “ON” position for a cold engine or the “OFF” position for a warm engine.
	3. Dirt in fuel filter.	3. Replace the fuel filter (bottom of fuel tank).
	4. Dirt, water, or stale fuel is in the fuel system.	4. Contact an Authorized Service Dealer.
	5. Air cleaner is dirty.	5. Clean or replace the air cleaner element.
	6. Electrical connections are corroded, loose or faulty.	6. Check the electrical connections for good contact. Clean connector terminals thoroughly with electrical contact cleaner, apply dielectric grease and reconnect.
	7. Relay or switch is defective.	7. Contact an Authorized Service Dealer.
	8. Faulty spark plug.	8. Clean, adjust or replace spark plug.
	9. Spark plug wire is not connected.	9. Check the spark plug wire connection.
Engine loses power	1. Engine load is excessive	1. Reduce the ground speed.
	2. Air cleaner is dirty.	2. Clean or replace the air cleaner element.
	3. Oil level in the crankcase is low.	3. Add oil to the crankcase.
	4. Cooling fins and air passages for the engine are plugged.	4. Remove the obstructions from the cooling fins and air passages.
	5. Dirt in fuel filter.	5. Replace the fuel filter (bottom of fuel tank).
	6. Dirt, water, or stale fuel is in the fuel system.	6. Contact an Authorized Service Dealer.

Problem	Possible Cause	Corrective Action
Engine overheats	1. Engine load is excessive 2. Oil level in the crankcase is low. 3. Cooling fins and air passages for the engine are plugged.	1. Reduce the ground speed. 2. Add oil to the crankcase. 3. Remove the obstructions from the cooling fins and air passages.
Machine pulls left or right (with lever fully forward).	1. Tire pressure in drive tires not correct. 2. Damaged control linkage. 3. Tracking not set.	1. Adjust tire pressure in the drive tires. 2. Replace control linkage. 3. Adjust tracking.
Machine does not drive.	1. Bypass valve is not closed tight.	1. Tighten the bypass valve.
Abnormal vibration	1. Engine mounting bolts are loose.	1. Tighten the engine mounting bolts.
Impeller does not rotate.	1. Debris buildup. 2. Hopper screen is plugged. 3. Spreader motor is loose or damaged. 4. Spreader motor hydro failure. 5. Spreader controller turned off or down. 6. Impeller motor bearing failure.	1. Clean impeller. 2. Clean hopper screen. 3. Repair or replace motor. 4. Check connections. 5. Check controller knob positions. Reset motor controller. 6. Replace bearing or entire motor.
Uneven spread/spray pattern.	1. Impeller is dirty or damaged. 2. Gate not adjusted properly. 3. Nozzles are clogged. 4. Hopper screen is plugged. 5. Material clumps over gate. 6. Diffuser ramp setting incorrect. 7. Air in spray system.	1. Clean, repair, or replace impeller. 2. Adjust the gate. See **Spreader Pattern Adjustment** section in Operation. 3. Unclog or replace nozzles. 4. Clean hopper screen. 5. Check motor shaft agitator pin presence. 6. Adjust pattern control. 7. Purge air from spray system.
No front spray or poor output.	1. Tank is empty. 2. Strainer is clogged or damaged. 3. Pump is clogged or damaged. 4. Nozzles are clogged. 5. Hoses are clogged, kinked, or damaged. 6. Spray control not on. 7. Spray pressure and speed incorrect. 8. Spray mixture is incorrect. 9. Spray system is leaking or sucking air. 10. Air in spray system.	1. Fill tank. 2. Clean, repair, or replace strainer. 3. Clean, repair, or replace pump. 4. Unclog or replace nozzles. 5. Clean, repair, or replace hoses. 6. Turn on spray. 7. Adjust pressure and speed. 8. Follow chemical manufacturer's recommendation. 9. Inspect system and clean, repair, or replace components as needed. 10. Purge air from spray system.
No material dispensed from hopper.	1. Hopper screen is plugged. 2. Gate not adjusted properly.	1. Clean hopper screen. 2. Adjust the gate. See **Spreader Gate Adjustment** section in Operation.

Problem	Possible Cause	Corrective Action
Spray wand does not work.	1. Tank is empty.	1. Fill tank.
	2. Control valve in wrong position.	2. Place in “open” position.
	3. Wand is clogged or damaged.	3. Clean, repair, or replace wand.
	4. Nozzle is clogged.	4. Unclog or replace nozzle.
	5. Trigger is not pressed.	5. Press trigger.
	6. Hoses are clogged or damaged.	6. Clean, repair, or replace hoses.
	7. Hose is not connected to wand	7. Reconnect hose.
	8. Hose is kinked.	8. Unkink hose.
	9. Spray system is leaking or sucking air.	9. Inspect system and clean, repair, or replace components as needed.
	10. Air in spray system.	10. Purge air from spray system.

Schematics



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Electrical Schematic (Rev. B)

Notes:

Notes:

California Proposition 65 Warning Information

What is this warning?

You may see a product for sale that has a warning label like the following:



WARNING: Cancer and Reproductive Harm—www.p65Warnings.ca.gov.

What is Prop 65?

Prop 65 applies to any company operating in California, selling products in California, or manufacturing products that may be sold in or brought into California. It mandates that the Governor of California maintain and publish a list of chemicals known to cause cancer, birth defects, and/or other reproductive harm. The list, which is updated annually, includes hundreds of chemicals found in many everyday items. The purpose of Prop 65 is to inform the public about exposure to these chemicals.

Prop 65 does not ban the sale of products containing these chemicals but instead requires warnings on any product, product packaging, or literature with the product. Moreover, a Prop 65 warning does not mean that a product is in violation of any product safety standards or requirements. In fact, the California government has clarified that a Prop 65 warning "is not the same as a regulatory decision that a product is 'safe' or 'unsafe.'" Many of these chemicals have been used in everyday products for years without documented harm. For more information, go to https://oag.ca.gov/prop65/faqs-view-all.

A Prop 65 warning means that a company has either (1) evaluated the exposure and has concluded that it exceeds the "no significant risk level"; or (2) has chosen to provide a warning based on its understanding about the presence of a listed chemical without attempting to evaluate the exposure.

Does this law apply everywhere?

Prop 65 warnings are required under California law only. These warnings are seen throughout California in a wide range of settings, including but not limited to restaurants, grocery stores, hotels, schools, and hospitals, and on a wide variety of products. Additionally, some online and mail order retailers provide Prop 65 warnings on their websites or in catalogs.

How do the California warnings compare to federal limits?

Prop 65 standards are often more stringent than federal and international standards. There are various substances that require a Prop 65 warning at levels that are far lower than federal action limits. For example, the Prop 65 standard for warnings for lead is 0.5 µg/day, which is well below the federal and international standards.

Why don't all similar products carry the warning?

- Products sold in California require Prop 65 labelling while similar products sold elsewhere do not.
- A company involved in a Prop 65 lawsuit reaching a settlement may be required to use Prop 65 warnings for its products, but other companies making similar products may have no such requirement.
- The enforcement of Prop 65 is inconsistent.
- Companies may elect not to provide warnings because they conclude that they are not required to do so under Prop 65; a lack of warnings for a product does not mean that the product is free of listed chemicals at similar levels.

Why does Toro include this warning?

Toro has chosen to provide consumers with as much information as possible so that they can make informed decisions about the products they buy and use. Toro provides warnings in certain cases based on its knowledge of the presence of one or more listed chemicals without evaluating the level of exposure, as not all the listed chemicals provide exposure limit requirements. While the exposure from Toro products may be negligible or well within the "no significant risk" range, out of an abundance of caution, Toro has elected to provide the Prop 65 warnings. Moreover, if Toro does not provide these warnings, it could be sued by the State of California or by private parties seeking to enforce Prop 65 and subject to substantial penalties.